THE PRESIDENT'S COMMISSION ON HEART DISEASE, CANCER AND STROKE

A NATIONAL PROGRAM TO CONQUER HEART DISEASE, CANCER AND STROKE

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REPORT TO THE PRESIDENT

A NATIONAL PROGRAM TO CONQUER HEART DISEASE, CANCER AND STROKE

Volume I

December, 1964

The President's Commission on Heart Disease, Cancer and Stroke

DEAR MR. PRESIDENT:

I have the honor to submit the report of the President's Commission on Heart Disease, Cancer and Stroke.

The Commission was appointed by you in March 1964, to develop a realistic battle plan leading to the ultimate conquest of three diseases—heart disease, cancer and stroke—which now account for more than 70 percent of the deaths in this country. In your initial charge to us, you requested us to recommend practical steps to reduce the heavy losses exacted by these diseases through the development of new scientific knowledge and through the delivery to all of our people in every part of this great land of the precious, lifesaving medical knowledge we now possess, but fail to bring to so many stricken American families.

Grateful beyond measure of expression for this Presidential mandate, we plunged into our assigned task—confident that the toll of these three diseases could in fact be sharply reduced now and in the immediate future. During the intervening months, as we sought and received testimony from scores of leaders in medicine and public affairs, our conviction mounted that we could chart a truly national effort—calling upon the full resources of Federal, State and local governments, the dedicated members of the health professions, and our great voluntary health organizations—leading to the increased control, and eventual elimination, of heart disease, cancer and stroke as leading causes of disability and death.

This report embodies our recommendations for such a united effort by a free and vigorous people. Our stated goals are neither impractical nor visionary—they *can* be achieved if we so will it. They *must* be achieved if we are to check the heavy losses these three diseases inflict upon our economy—close to $30 billion each year in lost productivity and lost taxes due to premature disability and death.

In the early decades of this Republic, our people tended to view disease as an irrevocable and irreversible visitation from an implacable Fate. Our remarkable progress against many diseases over the past half century—the life span of the average American has been lengthened by 23 years since 1900—is vivid proof of the reversibility of any disease process.

The great engineer Charles F. Kettering once observed that no disease is incurable: it only seems so because of the ignorance of man.

We submit this report, Mr. President, in the deep conviction that its immediate implementation will not only narrow appreciably the spectrum of our ignorance, but will contribute to the saving of thousands upon thousands of American lives now needlessly sacrificed to these three deadly enemies of mankind.

Respectfully yours,

Michael E. DeBakey

MICHAEL E. DEBAKEY, M.D.,
Chairman.

THE PRESIDENT'S COMMISSION ON HEART DISEASE, CANCER AND STROKE

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ACKNOWLEDGMENTS

In submitting its report the President's Commission wishes to express its profound appreciation for the generous assistance and cooperation offered by professional organizations, voluntary agencies, and other individuals and groups. A special expression of gratitude is due to Dr. E. Cowles Andrus and all others responsible for the Second National Conference on Cardiovascular Diseases, which was held during the period of the Commission's service, for providing us with preprints of their proceedings which served as basic scientific documentation for much of our work.

We wish also to acknowledge the unstinting cooperation of many agencies and branches of the Federal Government, with special thanks to Anthony J. Celebrezze, Secretary of Health, Education, and Welfare; to Surgeon General Luther L. Terry of the Public Health Service; to Dr. James A. Shannon of the National Institutes of Health and to Dr. Aaron W. Christensen of the Bureau of State Services (Community Health), for providing staff and support without which the Commission could not have performed its assigned function.

Finally, the Commission wishes to express its profound debt of gratitude to the staff members whose work, frequently performed under conditions of extreme pressure, was carried out with uniformly high quality reflecting great credit both on them as individuals and on the organizations they represent.

PERSPECTIVE

In seeking to develop a national program for the immediate reduction and ultimate conquest of heart disease, cancer and stroke, the President's Commission accepted a complex challenge.

There was need, first, to document in depth the dimensions of the problem and to assess the Nation's existing and potential resources for achieving the stated goals. Then it was necessary, based on these assessments, to draft recommendations scaled to the dimensions of the problem and tailored to the limitations of practicality.

We quickly recognized apparently conflicting sets of specifications in developing and presenting our program. The recommendations should be comprehensive—in order to advance the attack on all fronts—and yet sufficiently specific to serve as a blueprint for action. Moreover, it was essential that the program be understood and accepted by both the scientists and the policy making representatives of the American people.

The present report represents our attempt to meet these specifications. It is presented in two volumes, of which this is the first.

Volume I is the summary volume and is intended for wide distribution. It includes the Commission's recommendations for a national program to conquer heart disease, cancer and stroke.

Volume II, to be published in a more limited edition, is made up of the full reports of the eight subcommittees into which the Commission divided for a systematic approach to problems confronting it. It also includes additional scientific and technical documentation developed at the Commission's request by other individuals and groups.

The first two chapters of Volume I constitute the backdrop against which the Commission's proposals are to be viewed. Chapter One seeks to measure the impact of heart disease, cancer and stroke on the American people—in terms of deaths, disability, and economic costs—and describes current progress in scientific knowledge which offers hope for immediate and future reductions of this toll. Chapter Two discusses the Nation's current state of readiness to combat these three diseases, contrasting the manpower, facilities, and other resources now available with those which are needed to mount a full-scale attack, both in the delivery of medical service and in the discovery of new knowledge.

Chapters Three through Seven present the 35 specific recommendations of the Commission. These are grouped under five broad headings, related to specific areas of need for action. Chapter Eight deals directly with legislative and organizational problems which must be resolved if the specific recommendations are to be fully effective.

The Commission's suggestions for expenditures needed to carry out the proposed programs are tabulated in connection with each specific recommendation. Summary tables, which indicate the total funds recommended and compare these with existing levels of expenditure, will be found in Appendix A.

Considered broadly, the Commission's 35 recommendations are of two general types.

The first of these categories includes those recommendations which are directed specifically at the three diseases in question. These constitute the frontal assault on problems related to the conquest of heart disease, cancer and stroke.

Included in this category are the recommendations comprising the major innovative thrust of the report—the establishment of a national network of regional centers, local diagnostic and treatment stations, and medical complexes designed to unite the worlds of scientific research, medical education and medical care. This proposed national network would bring within reach of every physician and every patient, region by region and community by community, the very best in the diagnosis and treatment of heart disease, cancer and stroke. It would, in our judgment, have an immediate impact. It would save many lives and prevent widespread suffering—merely by making medical and scientific excellence in heart disease, cancer and stroke readily accessible to those whose lives depend on it. The national network program is described in detail in Chapter Three of the report.

In addition, the direct assault on the three diseases requires several other urgently needed programs. These include the strengthening of statewide laboratory programs for heart disease control, a national effort directed toward the detection of cervical cancer, the establishment of highly specialized research units for intensive study of specific disease problems, and augmented support of research in heart disease, cancer and stroke.

But heart disease, cancer and stroke cannot realistically be considered apart from the broad problems of American science and medicine. Therefore the second category of recommendations—no less essential than the first—is designed to strengthen the total national resource for advancing scientific knowledge and providing medical services.

Skilled manpower for the attack on heart disease, cancer and stroke must be drawn from the national reservoir of health manpower—and that national reservoir is seriously inadequate. Therefore, the Commission has recommended direct and forthright governmental support of medical education and other essential training programs.

Successful local programs for control of heart disease, cancer and stroke depend upon strong community health resources; therefore, the Commission has recommended programs to buttress these efforts. Similarly, research on specific disease problems depends upon a variety of supporting resources and mechanisms which are the subject of separate recommendations. Scientific knowledge on heart disease, cancer and stroke must be efficiently communicated among scientists, to practitioners, and to the public; thus, a number of recommendations are aimed at problems of communication.

In sum, if we are to conquer heart disease, cancer and stroke, we must, as a nation, rededicate and redirect our efforts toward this high purpose. We must strike boldly at the specific problems posed by each disease through a nationwide approach which represents a major innovation in American medicine. At the same time we must strengthen and support our entire health resource upon which the innovative attack must be based.

Commission's Report, Volume 1

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INTRODUCTION

In his Special Health Message to the Congress in February 1964, President Lyndon B. Johnson made the following announcement:

"I am establishing a Commission on Heart Disease, Cancer and Stroke to recommend steps to reduce the incidence of these diseases through new knowledge and more complete utilization of the medical knowledge we already have."

Two months later, when the newly formed Commission first convened at the White House, he said:

"Unless we do better, two-thirds of all Americans now living will suffer or die from cancer, heart disease or stroke. I expect you to do something about it."

Something *can* be done about it. Every day men and women are dying who need not die. Every hour families are being plunged into tragedy that need not happen. Wives are widowed, children left motherless—not for lack of scientific knowledge, but for lack of the right care at the right time.

Every available fact points to the same conclusion—that the toll of heart disease, cancer and stroke can be sharply reduced now, in this nation, in this time.

The sweep of scientific progress in the past decade has brought most forms of congenital heart disease within our powers of correction. Advances in surgery make it possible to save patients who would have been doomed five years ago; indeed, even one year ago. Rheumatic heart disease now can be virtually eliminated. Many strokes can be foreseen and prevented. Cancer of the cervix and uterus can be brought almost to the vanishing point, and chances are greatly improved for cure of cancer in other accessible sites, comprising over 70 percent of all cancer patients.

These things can be done now, without further scientific advance.

Meanwhile new knowledge of the fundamental processes of life promises great new weapons for the immediate future. Successful replacement of defective organs comes closer to reality each day. New methods of cancer detection and treatment are in immediate prospect.

The way is there. All that is lacking is the national will to give our people the full measure of protection against their three most deadly enemies.

The Commission is keenly aware that its Report will help to prolong life and ease suffering only if it is followed by vigorous action. Our aim is to kindle a re-dedication of our national health resources and a new awareness on the part of the American people, to the end that heart disease, cancer and stroke may be sharply reduced, increasingly controlled and ultimately conquered as enemies of Man.

The facts provide abundant proof that the goal is worth the striving.

Heart disease, cancer and stroke, taken together, claimed 1.2 million American lives in 1963—more than 7 out of every 10 deaths in this country.

The 365,000 Americans between the ages of 25 and 64 who died of these diseases in 1962 would have earned wages totaling more than $1.5 billion and paid close to $200 million in Federal income taxes had they lived one more healthy working year.

Moreover, this is only the beginning of the economic cost of heart disease, cancer and stroke; an estimated 14.6 million Americans are suffering from definite heart disease, and another 13 million from suspected heart disease.

At the same time, other facts demonstrate that the nation is capable of meeting the challenge.

Our nation's resources for health are relatively untapped. The rising tide of biomedical research has already doubled and redoubled our store of knowledge about heart disease, cancer and stroke. Yesterday's hopeless case has become today's miracle cure. We stand on the threshold of still greater breakthroughs in the laboratories and clinical centers of the nation.

Yet for every breakthrough, there must be follow-through. Many of our scientific triumphs have been hollow victories for most of the people who could benefit from them.

The obstacles in our path are many and formidable. Not the least of these is the harsh fact that modern medical care is too expensive for many of our people. Although our recommendations do not relate directly to this challenge, the Commission recognizes that our society must successfully overcome this obstacle if the promise of modern medicine is to be fulfilled.

Each premature death from heart disease, cancer and stroke is a personal tragedy. But each *preventable* death is a national reproach. Every year, more such preventable deaths are occurring—for the pace of science is bringing more within our reach, but the pace of application allows them to slip through our grasp.

We need to match potential with achievement, to fuse the worlds of science and practice. We need to develop and support a creative partnership among all our health resources. This way—which is the way of a democratic republic—is the true path to conquest of heart disease, cancer and stroke.

The first line of defense for our people's health is manned by private practitioners. The advance in biomedical research is led by individual investigators. The settings in which these men and women work are our great private, community and State institutions—hospitals, universities, scientific institutes.

Individual freedom is the cornerstone of the health structure.

Individual initiative is clearly visible also in the work of our great voluntary agencies in the health field. The American Heart Association, the American Cancer Society and others have pioneered in the support of health research and in speeding the delivery of the benefits of research to people who need them. Specifically, the funds raised by these organizations are channeled into research, into education of the public and training for the health professions, and into direct service for patients.

Local and State initiative is demonstrated by rapidly developing public health programs aimed at control of heart disease, cancer and stroke. State agencies

in particular are in process of accepting greatly increased responsibility for programs combatting these diseases.

At the same time, society as a whole has a heavy stake in the success of this endeavor. It is appropriate and necessary that the Federal government encourage, stimulate and support the upward thrust of national health.

Events of the past two decades have proved beyond question that such encouragement and support, far from interfering with personal and scientific freedom, has in fact created the conditions in which such freedom can realize full fruition. The solution to the problems of heart disease, cancer and stroke, can be built only on the foundation of a profound and truly national commitment to this end, by both public and private resources.

The nation's strength derives from the strength of its people. A national investment in the prolonging of productive life for its people pays rich dividends in national productivity.

Good health is good business for the nation.

But in a democratic society, there are other motives for action, more compelling still.

Heart disease, cancer and stroke cut life short; they curtail the enjoyment of liberty; they make futile the pursuit of happiness. One true measure of a nation's greatness is its success in making available to its people the means for protecting and enriching their individual lives.

The President's Commission on Heart Disease, Cancer and Stroke bases its Report on the conviction that the United States will measure up to greatness; that it will choose to continue and accelerate the forward thrust of medical research across new thresholds of discovery; and that it will resolve to make fully available the benefits of scientific knowledge to all those whose life and opportunity for individual fulfillment depend upon them.

We do not promise that our program will save a million lives next year. We do not guarantee to all the millions of victims of heart disease, cancer and stroke a new life free from pain and fear.

But we believe that many thousands of men and women who might live will die, needlessly, year by year, until the nation makes this new commitment.

We believe that many thousands of men and women will suffer and stand idle, needlessly, year by year, until the nation pledges its full resources to their cause.

To these men and women we dedicate this Report.

PROBLEMS, RESOURCES, AND NEEDS

THE DIMENSIONS OF THE PROBLEM

The first of the three objectives set for the Commission was to measure the magnitude of the impact of heart disease, cancer and stroke on the American people.

Such measurements have been made by many people, in various ways. The usual product of these assessments is a set of statistical tables. The numbers run into millions, sometimes billions. The columns drift into abstraction—age-adjusted death rates, man-hours, productivity.

These tabulations are valuable and necessary. They are especially valuable when they furnish clues for a more efficient attack on specific aspects of the problem. But they do not measure the true impact of the three great killing diseases on the American people.

They do not quantitate grief for more than one million American families every year.

They do not express the personal economic hardship that comes in the wake of a father's sudden, fatal heart attack. Nowhere in the tables will you find the heartbreak and the long emotional stress that follow a mother's death from cancer. They may count the number of hours of idleness enforced by chronic disability, but they do not measure the length of each hour.

These represent the true impact of heart disease, cancer and stroke. They should be read into every statistical paragraph, table and chart in the material that follows.

The Changing Pattern of Sickness and Health

Heart disease, cancer and stroke are overwhelmingly the leading causes of death in the United States today. Diseases of the heart and circulatory system—a broad category that includes strokes—now claim nearly a million lives each year. Cancer takes over a quarter million more.

In 1963, these diseases accounted for 71 percent of all deaths in the nation. Compared with them, all the other enemies of man—the great range of infectious diseases, accidents, congenital and nutritional disorders—fade into relative insignificance.

It has not always been thus. The ascendancy of the three great killers is a recent development. It is, in fact, a byproduct of brilliant progress in biological science and medical service.

A few short decades ago, tuberculosis was the greatest single menace to American health. Pneumonia and influenza took a heavy toll each year. Infectious diseases of infancy cut off many lives that had barely begun. For the overworked physician of horse-and-buggy days, heart disease and cancer were far down on his list of preoccupations.

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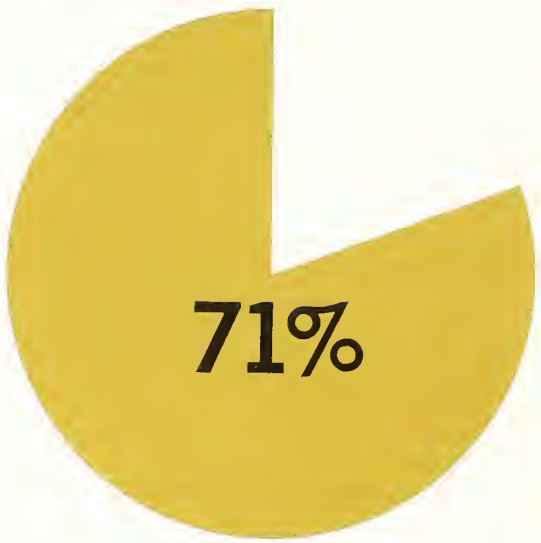
We are the beneficiaries of a great medical revolution. The first half century of scientific medicine has resulted in a swiftly growing population, a greatly lengthened lifespan, a level of well-being far above the highest expectations of our grandfathers' generation.

DEATHS FROM HEART DISEASE, CANCER AND STROKE IN 1963



It has also resulted in a heightening of our own aspirations. Death from heart disease or cancer, at a relatively advanced age, was once personally tragic but philosophically acceptable. Today we are no longer willing to tolerate what was once "the inevitable."

Our new intolerance is based on knowledge—that heart disease, cancer and stroke need not kill so many people today, and that tomorrow still more premature deaths will be within our power to prevent. From this intolerance comes determination. The magnitude of the problem, as discussed in this chapter, is not a *status quo* to be lamented and accepted, but a challenge to be met.

HEART DISEASE

Description

The term *heart disease*, as commonly used, includes a large number of conditions affecting the heart and circulatory system. It is not a single disease, but many. The *cardiovascular-renal* diseases—to use the broadly inclusive technical terms—can be divided into three major categories:

(1) Strokes—damage to the blood vessels affecting the central nervous system;

(2) Diseases of the heart itself and the blood vessels serving the body, including rheumatic fever and rheumatic heart disease, arteriosclerosis and degenerative heart disease, functional diseases of the heart, high blood pressure and hypertensive heart disease, and numerous other specific disease entities;

(3) Kidney diseases, including chronic nephritis and renal sclerosis, which are related to the circulatory system and are therefore included in the broad category.

Deaths from Heart Disease

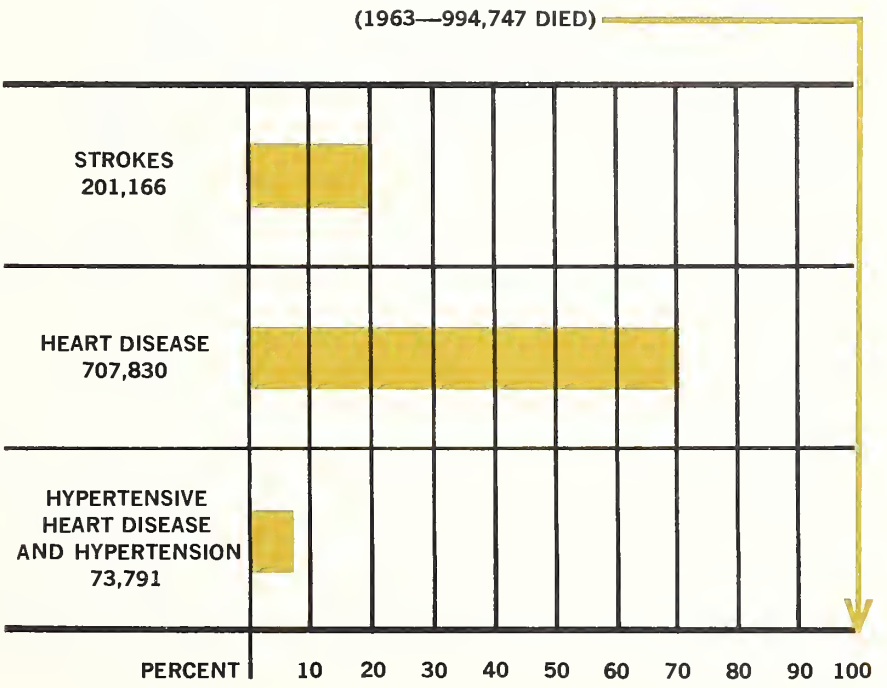
In 1963, 994,747 people in the United States died of the cardiovascular-renal diseases.

Of these deaths, about one-fifth (201,166) were caused by strokes. By far the largest share (707,830), over 70 percent, were caused by heart disease, predominantly arteriosclerotic heart disease including coronary disease (546,813). Hypertensive heart disease and hypertension accounted for about 7 percent (73,791), with the remaining deaths distributed among other disorders of the heart and circulatory system.

Heart diseases (and strokes) accounted for more than half (50.1 percent) of all deaths in the United States in 1963. In 1900, these diseases accounted for only about one death in seven.

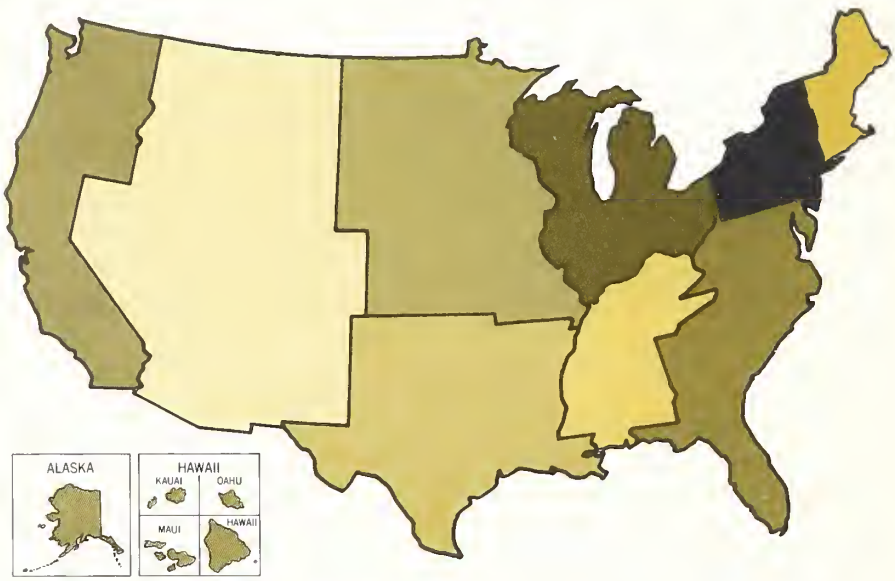
Heart disease is predominantly, but by no means exclusively, a cause of death among older people. About 72 percent of the 707,830 heart disease deaths in 1963 occurred in persons aged 65 and over.

There are striking differences in the heart disease rates by sex. Men outnumber women as victims by a factor of more than one-third—411,989 to 295,841. This is a relatively new and still incompletely understood phenomenon; until about 1930, the heart disease death rates for men and women were of about the same magnitude.



Interesting and unexplained variations exist in the geographic distribution of cardiovascular disease deaths in the United States. There is higher mortality—for both men and women—in the Eastern and far Western States, with lower mortality in the Central and Mountain regions. Death rates appear to be higher in large cities than in smaller towns and rural districts, but these differences do not fully account for the State-by-State and regional variations. Moreover, it is believed that persons born in "high mortality" States carry with them a high mortality tendency even though they may die in a "low mortality" State.

DEATHS FROM HEART DISEASE



Illness and Disability

The heart diseases, in addition to their dominance as a cause of death, are the cause of extremely widespread illness and disability in the United States.

Studies conducted by the National Health Survey of the U.S. Public Health Service in 1960–62 indicate that an estimated 14.6 million adults suffered from definite heart disease, and nearly as many had suspected heart disease.

Of every 100 persons in the population between the ages of 18 and 79, 13 had definite heart disease and 12 more had suspected heart disease. Thus nearly one-fourth of the adult population studied lives in certainty or in jeopardy of heart disease.

The most common condition discovered by the Survey was hypertensive heart disease, with 10.5 million "definite" and 4.7 million "suspect" cases. For coronary heart disease, the estimates were 3.1 million "definite" and 2.4 million "suspect."

In sharp contrast with mortality figures, "definite" heart disease was found to be more frequent in women than in men. Women were more likely to be suffering from hypertensive heart disease, while men were more likely to have coronary heart disease or heart disease of congenital or syphilitic origin.

The frequency of heart disease increases sharply with age. Fewer than 2 percent of those aged 18–24 had definite heart disease, while at the other extreme 39 percent of the men and 46 percent of the women aged 75–79 had definite heart disease.

Economic Impact

The economic cost to the nation of any disease may be measured in terms of its direct costs in diagnosis, treatment, and rehabilitation of patients suffering from the disease and the indirect costs associated with loss of earnings due to disability and premature death.

Heart disease, with its enormous death toll and still greater prevalence as a chronic disabling condition, imposes a multibillion dollar burden on the economy each year.

Direct expenditures for hospital and nursing home care, physicians' services, drugs and other medical services for persons with heart disease amounted to $2.6 billion in 1962.

About 15 percent of the total days of care in the nation's short-term hospitals are for care of heart disease patients, as are 28 percent of the patient days in skilled nursing homes. One out of ten visits to physicians in private practice are in connection with heart disease. Likewise, the drug bill for cardiovascular patients is estimated at 10 percent of all expenditures for prescriptions.

The direct costs are only the beginning. Those who are disabled by heart disease add another burden to the economy, owing to loss of output.

Taking into account members of the labor force, housewives, and others who were unable to attend to their usual activities, a total of 132 million work days were lost in 1962. These are equivalent to 540,000 man years, which amount to $2.5 billion in terms of 1962 dollars.

Other losses result from premature death. As we have seen, approximately a quarter of a million people in the most productive years (25–64) died of heart disease in 1963, slightly more than in the preceding year. Assuming that the deaths occurred evenly over the year, more than $1 billion worth of output was lost in 1962.

Had all those who died in 1962 lived just one more year, the economy would have gained $2 billion worth of output.

The nation is still paying in lost output for the people who died prematurely of heart disease in the recent past.

Of 26 million deaths due to cardiovascular diseases in the period 1900–1961, 6 million persons would have survived to 1962 and worked or kept house if this

major cause of death had been eliminated. The assumption is that the cardiovascular (including in this instance stroke) death rate became zero while the rates for all other causes remained unchanged.

In money terms the loss in output amounted to $24.5 billion.

It may be helpful to compare these losses due to heart disease to the gross national product (the market value of all goods and services produced by the economy). For this purpose the value of output imputed to housewives must be excluded.

The sum of direct costs, plus losses of output by members of the labor force due to heart disease, amounted to $22.4 billion, or 4 percent of GNP in 1962.

Progress and Prospect

The prospects are excellent for reducing the toll of heart disease in the years immediately ahead. Great strides have been made in the past 15 years on the research frontier. Today's challenge is two-fold—to bring these advances not just to the fortunate few but to the many who can benefit from them, and to continue to acquire new life-saving knowledge.

Medical research in the heart disease field has already paid rich dividends on the growing public and private investment in biomedical science. This progress has been documented in depth in the Report of the Second National Conference on Cardiovascular Diseases, based on an intensive review by hundreds of physicians and scientists. The following are a few of many examples:

Advances in surgery in the past ten years have already saved thousands of lives and promise to save many more.

Patients suffering from aneurysm—a ballooning out and thinning of the walls of an artery—were until recently almost certain to die within a year. Now the damaged section of the blood vessel can be removed and replaced with a substitute vessel made of a plastic material. A recent analysis of 1,000 such cases showed more than 90 percent success, even with extensive aneurysms of the aorta near the heart. Similar procedures, with similar prospects of success, can also be employed for replacing segments of blood vessels damaged by arteriosclerosis in the many instances in which such damages are localized.

Surgery of a highly complex nature is now possible on the heart itself, thanks to the development of artificial machines which can temporarily substitute for the vital functions of the heart and lungs. Valves of the heart which are defective because of congenital heart disease can sometimes be repaired, and valves with acquired damage are also being treated successfully.

Research on high blood pressure has brought into being a number of excellent drugs that effectively lower elevated blood pressure levels. This advance has already helped to produce, in the last decade, a significant reduction in the death rates for hypertensive heart disease. These drugs also make it possible for many people who suffer from high blood pressure to return to work and a normal life.

There is no question that this gain would not have occurred without effective research and its application.

We have not yet achieved a similar decline in the death rate from atherosclerosis, especially of the coronary arteries. Coronary heart disease remains the number one cause of death in the nation. But exciting beginnings have been made in this area also, and the prognosis for coronary patients is substantially better than it was a decade ago.

Electrical devices known as cardiac pacemakers have been developed that can restore a normal rate in a diseased and slowed-down heart. Some of these pacemakers, implanted inside the chest, can maintain a normal heart rate for years; over 3,000 people who might otherwise be dead are now living with implanted pacemakers.

Arterial embolism—a dreaded complication of acute heart attacks—is now greatly reduced in frequency thanks to anticoagulant drugs. Promising work is now underway with clot-dissolving drugs for the treatment of thrombosis.

In still another promising area, hard-won progress is being made in the extremely complex area of transplanting organs—including kidneys, lungs, livers, and recently hearts—into man.

Perhaps most dramatic of all, research efforts are now being directed toward the development of an artificial heart to replace a diseased heart. Experimental models have already been tried in man, and an effective model is within the range of possibility by 1970 or even earlier. This challenge—as exciting as any across the entire range of science—is enormously complex. It requires the combined excellence of physicians, engineers, experts in the development of synthetic materials, and many others. But physicians and engineers alike agree that this is not a dream. The goal is feasible; the problems are not insuperable.

Concerted effort on a large scale may well produce one of the most dramatic breakthroughs in scientific history.

Progress in understanding and controlling heart disease has far exceeded the fondest hopes of medical men a generation ago. But the challenges are many and formidable. Genuine control awaits further research discovery.

Meanwhile, substantial reduction of the toll of heart disease awaits a major nationwide effort to apply what is already known.

CANCER

Description

Cancers are uncontrolled new growths which invade and destroy living tissue. They are made up largely of cancerous cells which differ from normal cells in many ways.

Cancerous growth of the cells in various tissues occurs throughout the biological world. Birds and many species of animals are afflicted with various types of the disease. Its causes are not fully understood—although knowledge of factors relating to its development is growing rapidly. It is now clear that physical, chemical, genetic, viral, environmental, and perhaps other factors are involved.

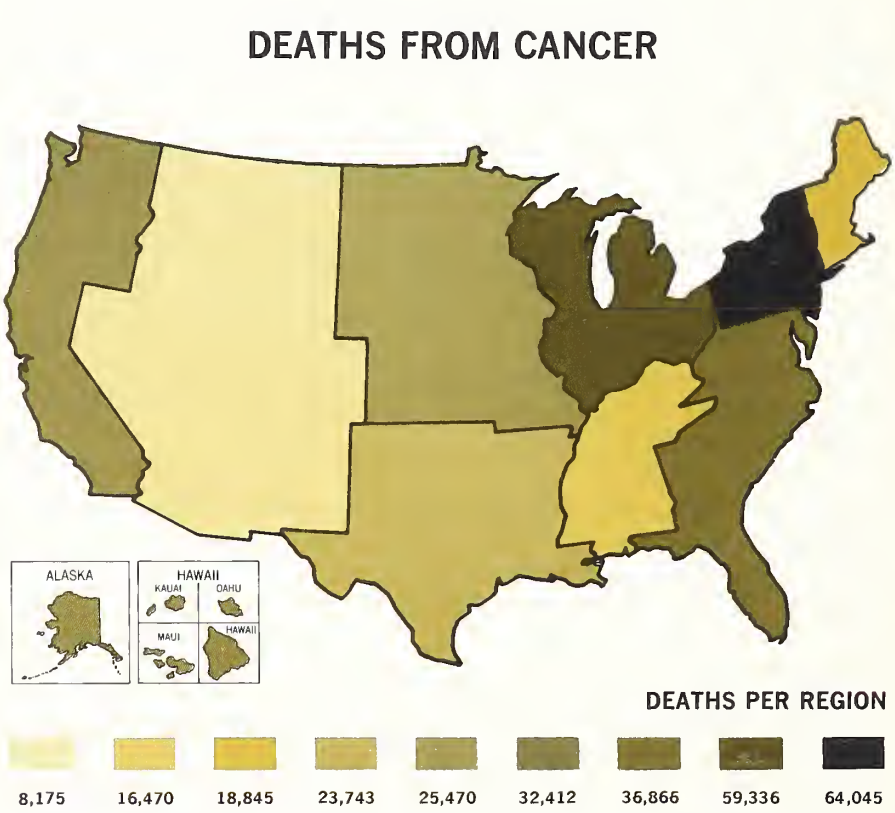
In man, cancer occurs in a variety of forms in many different organs of the body. The frequency of cancers in different sites varies relative to race, sex,

occupation, geography, and other factors. It also varies dramatically with the passage of time. Within a single generation in the United States one form of cancer—carcinoma of the lung in men—has increased strikingly while another—stomach cancer in men—has declined sharply.

Cancer Deaths

Cancer is the cause of 16 percent of all deaths in the United States. It is by a wide margin our second greatest killer.

In 1962, 278,562 Americans died of cancer; in 1963, the number was 285,362; in 1964, the number will exceed 300,000. These figures stand in sharp contrast to the situation in 1900, when only 3.7 percent of all deaths were attributed to cancer and when the disease stood far down on the list of causes of mortality.



The rise of cancer as a health menace can be charged in large part to the changing age composition of our population. Many more people are surviving the infectious diseases of youth and middle age only to succumb to the diseases of the more advanced years.

Yet cancer, like heart disease, is by no means reserved for the aged. In 1963, 45 percent of cancer deaths were in the age groups under 65. About 9 per-

cent—representing 25,629 people—were under 45. And cancer is either the first or the second cause of death in children between 1 and 14 years. Acute leukemia is the single most common form of cancer in children.

When cancer death rates are adjusted for the changing age composition of the population, it is still evident that cancer is an increasing threat. In 1900, the adjusted death rate was 79.6 per 100,000 people; in 1963, the comparable rate was 126.6.

Since 1933 there have been substantial changes in the cancer death rates for men and women. For men, from 1933 to 1963, the cancer death rate has risen from 104.6 to 147.1 per 100,000. For women, it has declined during the same period from 125.9 to 109.8. Thus cancer, which 30 years ago was more of a menace to women than men, has now reversed itself.

Cancer of the lung now accounts for 24 percent of all cancer deaths in males, with a total of 36,895 deaths in 1963.

Other leading cancer sites in males are the prostate (15,446 deaths), colon (13,932), stomach (11,896) and pancreas (8,944). For women, the leading sites are breast (25,139 deaths), colon (16,684), uterus (14,147), ovary (8,404) and stomach (7,404).

Thirty years ago, in males, stomach cancer accounted for 27 percent of all cancer deaths and lung cancer for only about 4 percent.

In females, cancer of the uterus and of the stomach were the two leading sites—in terms of death rates—30 years ago, accounting for 22 and 16 percent of all cancer deaths respectively.

Illness and Disability

It is estimated that about 830,000 people in the United States will be under treatment for cancer in 1964. This figure includes an estimated 540,000 new cases diagnosed for the first time. On the basis of current trends, about one out of every four people alive in the United States today can be expected to develop cancer at some time during his or her lifetime.

Thus, unless cancer illness rates are cut, about 48,000,000 people now living will become cancer sufferers.

Moreover, about 32 million Americans now alive will die from cancer unless new preventive measures, treatments or curative procedures are developed and widely used.

Economic Impact

The economic toll associated with cancer also costs billions of dollars annually.

Direct costs for diagnosis, treatment, and care of cancer patients amounted to $1.2 billion in 1962. More than half of the direct costs is for hospital care. Approximately 950,000 patients with a primary diagnosis of cancer spent more than 14 million days in short-term hospitals, accounting for 8 percent of the total days of care in the nation's short-term hospitals. The cost of the services of physicians in private practice for cancer patients is $172 million.

As in heart disease, these direct costs are only a part of the total economic impact of the disease.

A total of 54 million work days was lost in 1962 as a result of illness and disability for members of the labor forces, housewives, and others who were unable to attend their usual activities. These days lost are equivalent to 221,000 man years of productivity, or $1 billion in terms of 1962 dollars.

Forty-three percent of the persons who died from cancer in 1962 were in their most productive years (25–64). This loss to the economy amounted to more than 100,000 man years, or $430 million.

And as in heart disease, the nation is still paying in lost output for the people who died prematurely from cancer in previous years. There were 7.6 million such deaths during the period 1900–1961. Of this total 2.2 million persons would have survived to 1962 and worked or kept house if this major cause of death had been eliminated.

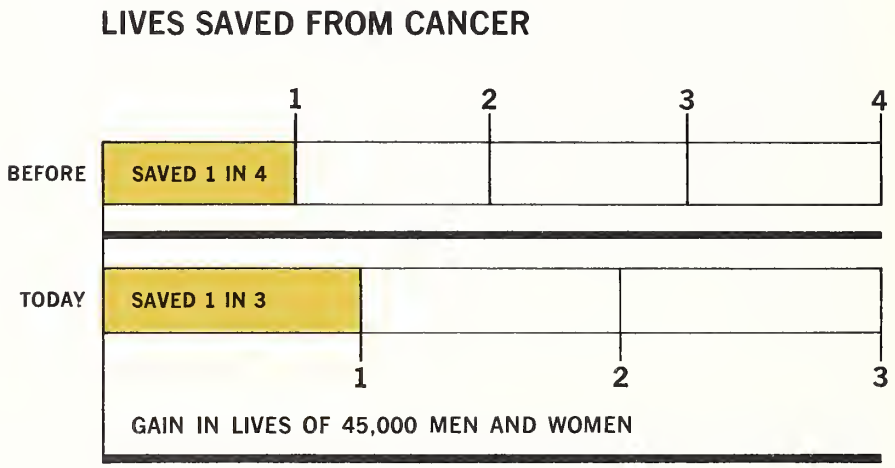
This loss in output amounted to $8.5 billion in terms of 1962 dollars.

To compare the losses due to cancer to the gross national product, the value of output imputed to housewives must again be excluded.

The sum of direct costs, plus losses of output by members of the labor force, amounted to $8 billion, or 1.4 percent of GNP in 1962.

Progress and Prospect

Today about one cancer patient in three is being saved. A few years ago the ratio was about one in four. This represents a gain in lives of about 45,000 men and women each year.



Using knowledge now available, this gain can be substantially extended.

Just by applying widely what we know, we could now save half of the people who contract cancer:

Uterine cancer can be detected at an early and generally curable stage by using a simple, well-established technique; unfortunately, relatively few women seek and obtain this examination in time.

New developments in the early detection of breast cancer hold forth the promise of similar reductions in deaths from this form of cancer.

Physical examinations using modern diagnostic techniques often lead to early recognition and successful treatment of cancer in many sites.

Lung cancer can be sharply reduced by reducing cigarette smoking.

Meanwhile medical research is opening up new pathways to diagnosis and cure.

The search for cancer-controlling drugs has already produced several which have cured cancers in animals. The National Cancer Chemotherapy Program has resulted in the formulation of 165,000 new drugs. These have been tested for possible effect on animal cancers and approximately 100 have been tried in human cancer. About 20 of these drugs have resulted in at least temporary benefit to human cancer patients with marked increase in survival and limiting of disability in patients with lymphoma including Hodgkin's disease, multiple myeloma, chorioepithelioma, melanoma, and certain tumors in children. Radiation treatment and surgery are being improved and refined to minimize side effects and maximize benefit.

Since World War II, nuclear medicine and radioactive isotopes have played a vital role in cancer diagnosis and treatment. Detection has been enhanced in cancer of the thyroid, brain, liver, stomach. Specific radioactive isotopes have been used in therapy of cancer of the prostate, thyroid, and bone marrow. The use of Cobalt 60, cesium, linear accelerators, betatrons, electron beam generators and other sources of supervoltage X-ray and gamma ray beams have made possible high energy (megavoltage) therapy in the average metropolitan area.

Here, the deterring factor is lack of manpower trained in the use of these methods. With properly trained radiation therapists available, improvement in most of the cure rates would be immediately possible for those patients with lesions suitable for such treatment.

In the quest for cancer's cause, biological research is producing important new understanding of the structure and functions of the cell, genetic controls, and the phenomena of resistance or immunity to disease—each of which may have great significance in cancer control.

Recent research in virology has shown that the leukemias of several species of animals, which are closely related to human leukemias, are definitely viral in origin. If leukemia in man proves to be initiated by viruses, preventive vaccines might well be in prospect.

Cancer, the number two killer of the American people, is a stubborn and mysterious enemy. But we can make substantial reductions in its toll now, by applying broadly what we know. The future is bright with promise of new scientific discoveries and their development to further useful applications.

STROKE

Description

The brain, because of its high energy requirement, demands over one-fifth of all the blood pumped from the heart. If circulation to the brain fails due to disease of the blood vessels, a stroke results. Strokes are often fatal. For those

who survive there may be disastrous impairments such as paralysis, loss of speech, and many others.

In general, strokes can be divided into three main types:

(1) those due to occlusion by thrombosis or clotting of the diseased vessel;
(2) those due to occlusion by a fragment of a clot which becomes dislodged from the heart or vessels of the neck and plugs the cerebral vessels; and
(3) rupture of a cerebral vessel due to high blood pressure or fault of the vessel wall (aneurysm) with hemorrhage into the brain.

The first two account for the vast majority of cases.

Deaths from Stroke

As we have previously indicated, strokes account for about one-fifth of the deaths within the broad category of cardiovascular-renal disease.

In 1963, about 201,000 Americans died of strokes. Thus, if stroke is considered separately, it ranks third as a cause of death in the United States. Its death toll is not far behind that of cancer, and more than double that of the fourth-ranking cause, accidents.

To a greater extent than heart disease and cancer, stroke is a disease of the aged. About 80 percent (162,755) of the 201,166 stroke deaths occurred in people aged 65 and over. The largest single number (73,388) occurred in the 75–84 age group.

However, stroke claimed 38,411 victims under 65—a total that seems small in proportion but is numerically large enough to rank stroke as the No. 5 killer of people in their most productive years, outranked only by heart disease, cancer, accidents, and suicides.

Unlike heart disease and cancer, stroke claims more female than male victims in the United States (106,927 to 94,239). Nonwhite females have the highest death rate from stroke by a substantial margin, but the death rate for white females is lower than that for nonwhite males. There is a definite pattern of geographic variation in the United States—the highest stroke death rates occur in the Southeastern States, and the lowest in the Southwestern and Mountain regions.

Illness and Disability

At least 2 million people now alive in the United States have suffered a stroke.

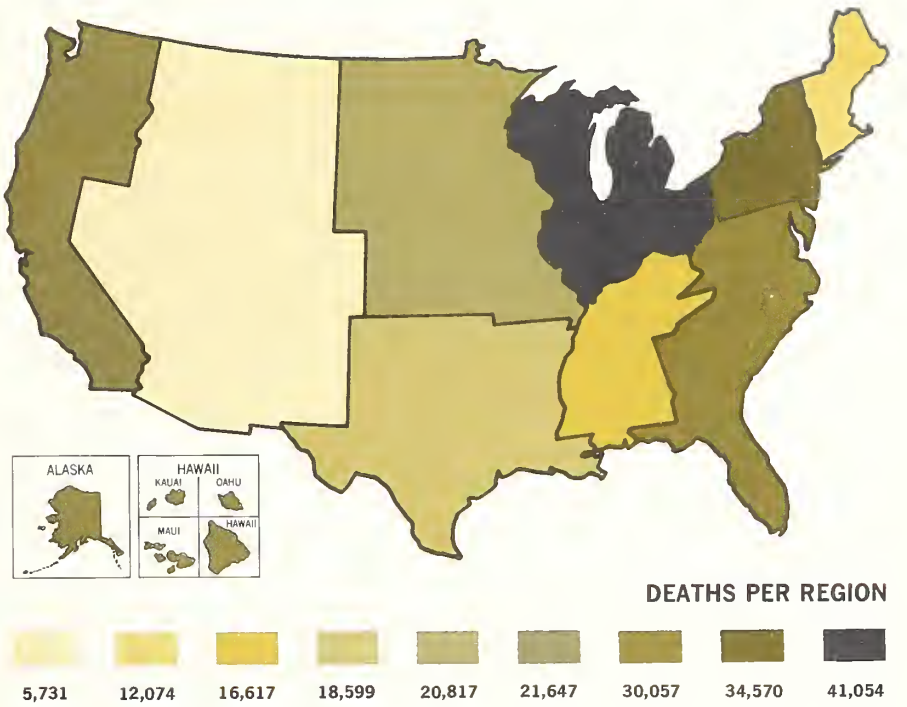
About 8 of every 10 stroke victims survive the acute initial phase of the disease. Most of them live for some years thereafter—usually in a seriously disabled condition.

The existence of these hundreds of thousands of surviving stroke victims is a deeply distressing fact of American life. It is made more distressing by the fact that most of it could have been obviated by the timely application of preventive or rehabilitative treatment. The economic burden imposed upon their families and their communities can be estimated. The loss of dignity and the accumulated misery is beyond calculation.

Economic Impact

Direct expenditures for services and supplies for diagnosis, treatment, and rehabilitation of stroke victims total $440 million per year according to conservative estimates.

DEATHS FROM STROKE



There were 283,000 patients with a primary diagnosis of stroke discharged from the nation's short-term hospitals in 1962. Stroke victims constitute 16 percent of the patients in skilled nursing homes.

Although 80 percent of the stroke deaths occurred in people aged 65 and over, the losses in output resulting from disability and premature death are equivalent to 179 million man-hours, or approximately $700 million in 1962 dollars.

This, of course, does not take into account losses in output for those who would have survived to 1962 if stroke had been eliminated as a cause of death. Excluding these losses from previous years' deaths, the economic costs of strokes to the nation in 1962 is approximately $1.1 billion.

Progress and Prospect

Stroke has been for many years a tragically neglected disease. The health professions have shown little interest in it; the public has accepted it with resignation.

At the root of this neglect are several misconceptions. The most important of these has been the assumption that stroke is simply "a way of dying" after the body has survived all the other ravages of time—as inevitable as death itself. Another has been the oft-quoted half-truth that stroke is "a later life edition of

coronary heart disease"—a statement now open to more than reasonable doubt.

The facts are quite otherwise. Stroke is proving to be neither inevitable nor irremediable. Slowly mounting interest over the past decade has revealed genuine hope for stroke victims, both present and future.

First, many strokes can be foreseen.

Three out of four patients with occlusive stroke have symptoms that forewarn of a disabling attack. Some of these warning signs are brief attacks of loss of speech, weakness of limbs, staggering, or loss of consciousness.

Clearly, any of these signals may be caused by a variety of other conditions. But a physician, not the patient himself, should make the determination.

This determination can be a lifesaver. About three out of four patients with symptoms of stroke experience a discernible narrowing of the blood vessels supplying the brain. This condition can often be corrected by modern surgical techniques. The precise indications for surgical and medical treatment need to be better defined, but the prospect is excellent.

Second, intensive modern rehabilitative care can restore as many as 80 percent of stroke survivors to relatively active and productive living.

A well-defined and tested program of medical rehabilitation has been developed which, if started early enough and carried through, can make the difference between total dependency and self-sufficiency. A few such programs are underway, but they are reaching pathetically few of the thousands who can benefit from them.

Third, promising new avenues for research are opening up in stroke prevention and treatment.

Among these are epidemiologic studies to define patterns of distribution of stroke; alteration of blood-clotting mechanisms; control of fat metabolism and hypertension; blood vessel surgery; new drugs to improve circulation to the brain; and experimentation with high pressure oxygen chambers.

Stroke claims 200,000 American lives a year. It incapacitates many hundreds of thousands. The financial, as well as the human, cost of stroke weighs heavily on the patient, his family, his community, and taxpayers everywhere. It is imperative that this disease be brought into the mainstream of medical and scientific attention, to develop new knowledge and to apply widely what is already known.

PROBLEMS, RESOURCES, AND NEEDS

NATIONAL RESOURCES AND NATIONAL NEEDS

America need no longer tolerate several hundred thousand unnecessary deaths each year from heart disease, cancer and stroke.

By bringing to all the people the full benefit of what is now known of prevention, detection, treatment, and cure, we could save, each year, a number of lives equal to the population of a major city.

This is the measure of our capability today. As scientific knowledge advances, tomorrow's promise is brighter still.

Thus the keynote is hope, based on hard scientific fact.

The fact that the death toll can be strikingly reduced is easily documented. To cite a few specific examples:

Until a few years ago, victims of certain congenital heart defects were almost sure to die in infancy. The few who survived the first year of life lived at most a few short years in a condition of helplessness. Today, normal, healthy children are growing up toward productive adulthood who would have been hopelessly doomed before present corrective procedures were developed.

Until very recently, 9 out of every 10 persons who developed the disease known as aneurysm were dead within 5 years after the condition was diagnosed. Today, 7 out of 10 who receive the benefit of new surgical procedures are alive and well at the end of five years.

Until the development of the Papanicolaou smear test, cancer of the cervix could rarely be diagnosed until too late for successful treatment. Today, there is almost 100 percent survival and cure for those who receive early diagnosis and treatment.

These are examples—among many—of the dividends paid by medical research.

Tragically, they also furnish examples of failure to deliver to the people the benefits of research. For babies still die of congenital defects, and patients still die of aneurysms; 14,000 women still die each year of uterine cancer—not because they must, but because they have not been reached by scientific medicine. For them, the promise of modern medicine has been unfulfilled.

Needed now, to transform hope into reality, is a national decision to invest a larger share of its vast wealth in the preservation of human life, and to develop new patterns of partnership between its public and private resources for health.

The principal challenge before the President's Commission has been to determine the shape and dimensions of this new partnership.

We have examined the nation's resources—actual and potential—for conducting a major offensive against heart disease, cancer and stroke, and have identified gaps which must be filled and obstacles which must be overcome if that offensive is to be successful.

Heart disease, cancer and stroke are by no means the only health problems confronting the American people. The doctors, nurses and others who care for patients suffering from these diseases are drawn from the nation's total manpower

pool for medical care. The scientists who investigate research problems related to these diseases are part of the total manpower supply for biomedical research.

Thus, in assessing the nation's resources for acquiring more knowledge and making full use of existing knowledge about heart disease, cancer and stroke, we must be concerned with broad national resources for medical service and medical research.

RESOURCES FOR HEALTH SERVICE

The prevention and control of heart disease, cancer and stroke—the saving of human lives—begins not with the doctor, the hospital or the medical center, but with the individual himself.

He decides to go for a check-up—either before symptoms appear, or at the earliest sign of trouble. Or he decides not to. The decision—often made casually, or not consciously made at all—may add or subtract a decade from his life.

Many factors influence his conscious or unconscious decision. One is the state of his knowledge about health matters. Another is his financial condition.

An important third is the convenience and accessibility of medical services in his community.

Once he enters the medical orbit, his fate is again subject to many whims of chance. If he is wise enough to make his appointment soon enough, and if the physician he chooses is trained and equipped to detect an incipiently dangerous condition and make the proper referral, and if his community is blessed with the special skills and facilities his condition requires, and if he is able and willing to follow through the prescribed course of treatment—in this happy conjunction of circumstances his life will be prolonged, his function unimpaired or restored.

Breakage of any link in this chain can nullify the strength of the others.

Thus, the delivery of the great potential of modern medicine depends upon many factors.

It depends upon an adequate supply of highly skilled manpower. The physician is the most critical single resource—there must be enough doctors in the community, and their medical knowledge must be up to date. Moreover, they must be supported by a wide range of well-trained assistants.

It depends upon a variety of health care facilities and services—conveniently accessible and staffed and equipped to meet the patient's needs.

It requires an alert, well-informed citizenry, motivated to take early and decisive action in behalf of their own health and financially able to meet the costs of care.

Manpower for Health Service

The first hard fact to be faced is that there is not enough health manpower to meet the needs of the American people.

There are not enough doctors and not enough supporting people.

In broad terms, 3 to 4 million persons are involved in the many aspects of health services through employment in dozens of different occupations and careers. A full-scale attack on heart disease, cancer and stroke will require expansion of the entire work force in health services.

The physician supply is beyond question the most critical single element in manpower for medical service. The physician calls the shots in every individual case. And the national toll of death and disability is only the sum of individual cases.

The number of physicians in the United States has approximately doubled since 1900, while the population of the country has increased two and one-half times. In the decade 1950–1960, the physician supply barely kept pace with population growth.

Thus, the overall ratio of physicians to population is about the same as it was ten years ago, and slightly lower than at the turn of the century.

Meanwhile drastic changes have taken place in the practice of medicine. With the forward sweep of scientific knowledge has come the necessity for specialization. In 1930, only one doctor in six was a specialist. By 1950, the proportion had grown to 36 percent. Today, 61 percent of all physicians in practice consider themselves specialists, and seven out of ten graduating physicians are undertaking specialized training.

Specialization has brought great benefits. But these have not been achieved without cost. The number of physicians having "first contact" with patients as personal or family doctors has fallen sharply.

How many physicians are needed to serve our future health needs?

The most conservative estimate projects a need for 346,000 physicians by 1975. This number is required merely to hold our own in the race against population growth.

It fails to take into account increasing demands and expenditures for health service *per capita*.

It fails to provide for any greater effort to deliver the best in modern medicine to those who need it. It is a *status quo* figure.

Yet conservative as it is, our current prospects are for meeting that number only through extensive importation of foreign-trained physicians. Currently our hospitals are heavily dependent upon foreign nationals serving as interns and residents. Clearly the United States should not be a debtor nation in terms of medical manpower.

Yet such is the case today. About 7,700 physicians graduated from the nation's 87 medical and 5 osteopathic schools in 1964. We must be able to graduate an additional 1,000 per year, starting now, to keep pace with population growth. Present trends, including the 12 to 15 new medical schools in various stages of development plus anticipated expansions of existing schools, will yield approximately 9,000 per year by 1975 and fewer than that in the intervening years.

The Health Professions Educational Assistance Act, enacted by the Congress in 1963 and funded in 1964, is a step in the right direction. It enables the Public Health Service, for the first time, to provide substantial financial assistance in the construction of new medical schools and the expansion of existing schools.

But it falls far short of the all-out national effort needed to meet a critical national problem—the shortage of physicians.

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In the Commission's judgment, a major national effort is required, on a scale never before attempted, to recruit and educate physicians to serve the health needs of the nation.

Existing schools must be expanded to full capacity and new schools must be built. Talented young people from every stratum of our society must be attracted to the medical profession in greater numbers.

We have great resources to draw upon.

In the United States only 1 medical student in 10 is a woman, as compared with 1 in 4 in Great Britain and 3 in 4 in the Soviet Union. In the United States, because of the length and excessive cost of medical training, a great proportion of medical students are drawn from upper-class families—49 percent from families with incomes of $10,000 or more per year. Scholarship programs—comparable to those which attract young people to other scientific fields—could greatly broaden our pool of potential physicians for the future.

Moreover, the national supply of physicians is by no means the only limiting factor in manpower for the control of heart disease, cancer and stroke. For example: the use of the Papanicolaou smear test for detecting cancer of the uterus can be no more widespread than the availability of technicians capable of performing cytological procedures; the number of laboratory personnel trained in identification of the streptococcal organism which leads to rheumatic fever is an important factor in the control of rheumatic heart disease; rehabilitation of stroke patients depends upon an adequate supply of therapists and nurses skilled in up-to-date techniques.

One of the ironies of our time is the existence of manpower shortages across the entire range of health occupations in a time characterized by manpower surpluses. Finding productive work for the young, the retired, the handicapped, the technologically displaced worker is a major challenge of the day.

Yet the health disciplines exist as an island of scarcity in a sea of plenty.

Each of these groups, whose idleness is a personal and national crisis, is an untapped reservoir for health service. To take advantage of it, the health professions must reexamine and restructure their patterns of work. They must experiment boldly with new kinds of teamwork between highly skilled and lesser skilled workers, and then work closely with the educational forces of the nation to design training programs to attract and prepare whole new groups of people for service to health.

Facilities for Health Services

A century ago a hospital was a final port of call, a place in which to die. People passed its portals with averted eyes.

Today's hospital represents a citadel of hopes—some true, some false. It is looked upon as a place where daily miracles are performed. In many hospitals, the miraculous has become almost routine. But in others, standards of care are far below what they should be.

The years since World War II have witnessed a genuine revolution in hospital care in the United States. Thanks in large measure to the Hospital and Medical Facilities Construction (Hill-Burton) Program of the Public Health Service, the

map of the nation's medical facilities has been redrawn. Hill-Burton funds have helped to build more than 7,000 hospitals and other centers for medical service. They have added more than 300,000 hospital beds and over 2,000 other facilities to America's health resources.

This has been achieved at a total cost of $6.8 billion, of which slightly less than one-third came from the Federal Government—the remainder coming from local sources.

But weak points remain in our hospital armament.

There are serious shortages of beds serving many fast-growing suburban areas. The older hospitals in the central cities of metropolitan areas are urgently in need of replacement or modernization. These large and once great metropolitan hospitals, many of them associated with universities, should be the centers of excellence, the foundation stones of our entire system of delivering the best in medical care. Instead they have been allowed to deteriorate physically. Many are poorly located in terms of the changing population patterns of the city.

In addition there is a serious shortage of facilities for the care of chronically ill patients.

Today, many beds in general hospitals, equipped to provide maximum service, are being occupied by patients with long-term illness who could be better served, at a fraction of the cost in both money and professional time, in facilities specially designed to meet their needs. State hospital construction authorities report that a national total of 530,000 additional long-term beds—in chronic disease hospitals and nursing homes—are needed to meet the present demand. With a rapidly expanding aged population, the long-term care requirements are sure to increase rapidly.

Communications for Health Service

The forward sweep of medical science has brought about a kind of "instant obsolescence" in medical knowledge. Most of the physicians practicing today received their medical education in the 1930's and 1940's. The fact that they are practicing two or three decades later would have been unimportant in earlier, quieter centuries. Today, it poses a critical obstacle to the delivery of up-to-date health care.

Therefore, a systematic nationwide program of continuing education for physicians is a categorical imperative of contemporary medicine.

Without a large-scale, effective effort, the worlds of science and practice will spiral still further apart. The gap between what is known and what is received by patients will be harder and harder to bridge.

The imaginative use of new communications media offers the best hope for necessary breakthroughs in continuing education.

Closed circuit television, beamed from a medical center into community hospitals at regularly scheduled hours, is one type of experiment that has been carried out successfully in recent years. Open circuit television is suitable for most medical transmission and has been tried during late evening and early morning hours. New types of projectors are becoming available which enable the physician to rent and study films in his own office.

All of these approaches are being tested on a small scale in various places around the nation, under a variety of sponsorships. In the Commission's view, what is needed is a greatly accelerated and concentrated push for continuing education, with sufficient resources of funds and talent to make a genuine impact.

But neither open circuit nor closed circuit television can reach closed circuit minds.

Alert and informed patients can generate a demand for new knowledge where all other motivations fail. This is one of the compelling reasons—the other, as we have seen, being the fact that the patient must take the first steps to save his own life—for greatly increased emphasis on informing the public.

The public has an almost insatiable thirst for health information. Yet the public remains remarkably uninformed, or remarkably slow to act, on many matters which are quite literally "of life and death." Part of the problem may stem from the sheer profusion of frequently half-true or half-hearted information, reaching the public.

The blame for these shortcomings rests not primarily with the mass media but with the health professions themselves. Science writing has become a highly developed skill; yet rarely are science writers invited behind the scenes and truly educated so that they may do an interpretive job. Funds and imagination are rarely made available to apply the awesome power of television and radio to a specific health problem requiring specific public action.

At the Federal level, the public information function has traditionally been viewed darkly. Fears of "self-aggrandizement" and "propaganda" have caused agencies—notably in the health field—to bury or disguise their appropriations for informing the public. This—in the health field—is both ironic and tragic.

The Commission believes strongly that public information is a primary health tool; that the Public Health Service has a duty—a major duty—to deliver authoritative health information to the people of the United States; that this function can in fact save many lives in the field of heart disease, cancer and stroke alone; and that it should be openly recognized and supported on a scale commensurate with its importance.

Coordinated Effort for Health Service

Throughout this discussion of resources for medical service, especially as related to problems of heart disease, cancer and stroke, we have faced the fact that resources for health are in short supply and that there is no simple, overnight solution. Resources for the delivery of medical service, community by community, will never be all that they should be in terms of adequate manpower, facilities, and supporting services.

Therefore there is an overriding need for coordination of effort. We cannot afford duplication of facilities, waste of rare skills on commonplace tasks.

The recommendations of the President's Commission dealing with the delivery of health services to reduce the impact of heart disease, cancer and stroke are designed to achieve two goals: to strengthen the nation's health resources both numerically and qualitatively, and to make the best use of resources we now have.

RESOURCES FOR RESEARCH

We are living in a time of brilliant progress and still more brilliant promise in the health sciences.

But biomedical research is not a simple matter. The biologist confronting a bacterium is dealing with a system immeasurably more complex than is the astronomer confronting a star. When the biologist undertakes the study of a certain man afflicted with a certain disease in a certain environment. the subtleties and complexities multiply toward infinity.

Biomedical science cannot promise that it will understand heart disease and cancer tomorrow. It cannot swear that its growing but limited understanding will lead inevitably to means of prevention and cure. But it can point proudly to past and present successes. and hopefully to existing clues and leads.

But *without* a major continuing research effort there is no hope of advance. no prevention. no cure of those conditions currently beyond our grasp. And to the extent that the quest is successful. the benefit to humanity. whatever the cost. will be cheap indeed.

The Nature of Research

Scientists use the word *research* to describe a process whereby questions are asked of nature and answers are systematically obtained; the object is the enrichment of man's knowledge; the driving force behind it is the curiosity of the investigator.

In the biomedical sciences. we are dealing with a spectrum of investigation. ranging from fundamental inquiry into the nature of living cells. at the "research extreme." to clinical care of patients at the "developmental extreme." Intermediate steps include laboratory investigation of disease. clinical and epidemiological investigation of disease in man, experimentation with drugs and procedures, and clinical trials.

No band of color in this spectrum is any more "pure" or more "basic" to the solution of disease problems than any other. All are essential. and they are mutually reinforcing.

Where in this spectrum of activity are the limiting barriers to progress against heart disease. cancer and stroke?

In the judgment of the Commission. they appear to lie chiefly at the ends of the spectrum. On the one hand. there is urgent need of more fundamental knowledge of biological processes—the structure and function of organisms, and the nature of disease. On the other. there is a serious lag in the widespread dissemination throughout medical practice of advances already clinically tested and proved in the great medical centers.

The Commission feels strongly that progress in understanding and control of heart disease. cancer and stroke depends to a considerable degree on new fundamental knowledge of the structure and function of living organisms in health and disease. It urges that every effort be made to support and quicken the pace of research addressed to these problems.

The Conduct and Support of Health Research

Medical research today requires specially trained people in specially designed environments. The national pool of qualified investigators and of institutions equipped to undertake significant research programs is strictly limited.

The basic unit of medical research today is a small team, comprising an experienced investigator and his immediate associates. Their most frequent habitat is the medical school or graduate school of one of our great universities. A lesser number thrive in a few research-oriented hospitals and research institutes.

Thousands of research projects are currently underway. Almost all of them are built around the research team—larger or smaller depending on the scope of the project. Their costs range from $5,000 to $500,000 with perhaps 90 percent of them costing between $15,000 and $100,000 per year.

The total annual cost of these thousands of research projects plus the supporting services which maintain them has reached approximately $1 billion in the United States. This represents a spectacular expansion in less than two decades; and with rapid expansion has come awkward and patchwork organization.

Yet the system works.

As we have seen, it has produced remarkable gains in knowledge, many of which have been translated directly into longer lives and freedom from pain.

The costs of medical research are paid from a great variety of sources: university endowments, individual and corporate gifts, foundations, public and voluntary agencies, State legislatures, and the Federal Government. The Federal share now represents somewhat more than one-half of the total funds spent for medical research. The U.S. Public Health Service, through its National Institutes of Health, is the world's primary supporting agency for medical research.

The basic building block of medical research support is the grant-in-aid awarded to an investigator to carry out a specified project. The process begins with the submission of a grant application containing a research plan. This is reviewed by scientists knowledgeable in the investigator's chosen area of study. If it is approved, the investigator is awarded funds to pursue his line of research.

This system has a number of built-in advantages. It permits large-scale use of Federal funds without Federal control. It keeps the initiative with the individual scientist. The investigator's plan is judged by a jury capable of rendering competent scientific judgment.

The system also has some disadvantages.

The support is unstable, year by year; this fact not only creates apprehension on the part of the investigating team, but also tempts the scientist to select the problem promising quick return rather than the long-range project.

From the standpoint of the university, the burden of establishing and maintaining a substantial research enterprise within which scientists may pursue their separate goals is a heavy one—too heavy for most schools already overburdened with soaring costs related to their teaching programs.

For the granting agency—be it governmental or private—the proliferation of individual grants creates tremendous administrative problems. For the

scientific manpower pool, the review process is costly in precious time.

Other governmental mechanisms for support have been developed to fill in around the research project grant procedure. Federal funds are available to aid in constructing research facilities, to help support training programs for research manpower, and, in a relatively few instances, to give support in breadth and depth to an institution's research program as a whole. Each of these programs serves a vital purpose, and helps to keep the basic system going.

In addition to the research programs of universities and medical schools, there are mission-oriented research institutes dedicated to research on a specific problem such as heart disease or cancer. Here, research is more directly programed. In such an institute are individual scientists working, for example, on vascular surgery; others working on testing drugs which may lower blood pressure; examining the muscular tissue of the heart, and the like.

Such centers of research excellence, spearheads of an all-out attack on heart disease, cancer and stroke, are few in number today. A major recommendation of the Commission has to do with the creation of more.

But it should be remembered that the Commission's endorsement of the center approach does not imply lack of faith in the basic system of individual grants. The two systems are complementary. Their products are mutually reinforcing.

Manpower for Research

A recent study shows that about 39,700 professional health workers were engaged in medical and health related research in 1960. This corps forms the base upon which future manpower resources must be built.

The same report, basing its estimate on projections as to the total medical research investment anticipated in 1970, projects the nation's need for medical research manpower at the level of 77,000 professional workers at the end of this decade—almost double the 1960 figure. There will, of course, be some normal attrition in the ranks of the present research manpower pool. Taking this into account, some 45,000 professional workers, fully qualified to engage in medical research as independent investigators, must be recruited and trained by 1970.

It is estimated further that about one-half of the Ph. D.'s and two-thirds of the M.D.'s in this needed addition of 45,000 will have to come from the present pool of Ph. D.'s and M.D.'s if the need is to be met. This assumption has heavy implications for other manpower requirements—including those for medical service.

The National Institutes of Health of the Public Health Service is the largest single supporter of training for medical research manpower. NIH spent about $189 million in fiscal year 1964 for research training—a 20-fold increase in a little over a decade. The largest share of this expenditure (40 percent) is for training in the mental health field.

The National Heart Institute support of training totaled $16 million; that of the National Cancer Institute, $10 million. More than 90 percent of the total NIH training budget is spent for graduate training.

Facilities for Research

In addition to its exacting demands for highly skilled manpower, modern health research requires a great number and diversity of special facilities and supporting resources.

At one extreme—the extreme nearest the patient—is the clinical research facility where medical care of human patients is carried on in a research environment, with special laboratories, kitchens, and the like adjoining or directly related to the patient's quarters. Their common purpose is to combine therapy with research: to provide patients with the best in modern care while at the same time studying in minute detail the results of the care provided.

At the opposite extreme, in the realm of basic science, is the biomedical research institute which works with highly sophisticated equipment to elucidate the basic properties of the living cell or the chemical synthesis of a hormone.

Between these extremes there are many intermediate types of facilities. There also exist certain research institutes which combine clinical and basic biomedical investigation. And in addition, contemporary research requires supporting resources, such as highly specialized research units, animal facilities, and many others.

Since 1956 the National Institutes of Health have been supporting the construction of health research facilities through a construction grant program. In eight years, 1,129 grants totaling $270 million have been awarded to medical schools, universities, hospitals, and other agencies as the Federal share of research facilities construction whose total value is four times as great.

This program continues to make a vital contribution, but the need for facilities is still outrunning the supply.

Communications for Research

The information explosion in biomedical science has created a massive communications problem. The enormous volume of new knowledge generated and reported each year has overflowed all the normal channels.

The traditional main artery of research communications is the scientific journal. Some 1,500 journals related to biomedical science are presently published in the United States. Another 4,500 are published elsewhere in the world, in many languages.

The core resource for managing materials in the biomedical sciences is the medical library system.

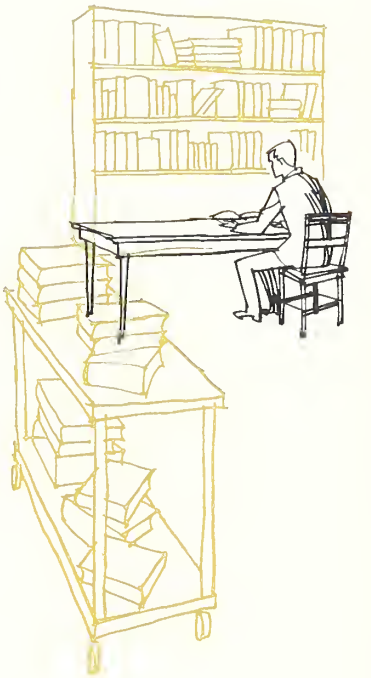
At the heart of this system is the National Library of Medicine, now a part of the Public Health Service. The NLM publishes *Index Medicus*, a giant monthly bibliography of medical periodical literature. It operates interlibrary loan services and offers photoduplication of source materials. Its operations have been greatly strengthened in the past year with the activation, in December 1963, of the computer-based Medical Literature Analysis and Retrieval System (MEDLARS)—the largest such information storage and retrieval system yet devised for a published literature. Monthly publication of the *Index Medicus* occupies only a small portion of MEDLARS capacity. Potentially, it can also handle 150 recurring specialized bibliographies plus as many as 37,500 individual

inquiries for bibliographic search in a given year.

The rapid advance of electronic storage and retrieval systems is the brightest ray of hope in the otherwise cloudy picture of communications for research. But electronics cannot solve the problem alone.

The present state of most medical libraries in the United States is lamentable—largely because libraries have not received their due share of the greatly increased attention and funding for research. The existing 87 medical school libraries—which should be the cream of the crop—have collections which fall, in total, 4 million volumes short of a desirable level. They are cramped for space and deficient in manpower.

The Commission feels strongly that unless major attention is directed to improvement of our national medical library base, the continued and accelerated generation of scientific knowledge will become increasingly an exercise in futility.



TOWARD THE CONQUEST OF HEART DISEASE, CANCER AND STROKE

A NATIONAL PROGRAM FOR A NATIONAL GOAL

Our assessment of the nation's resources for health service and medical research has accentuated needs and shortcomings—for it is these which must be remedied if we are to move toward the conquest of heart diseases, cancer and stroke.

These needs are genuine, and the obstacles to progress are formidable. But we can count on many strengths as well.

For the delivery of health services we have a strong and dedicated group of physicians, dentists, nurses, and their many professional and technical allies, working in private offices and community hospitals across the nation.

Their work, in turn, is supplemented and supported by other agencies and groups.

The public health departments of cities, counties and States are rendering a growing number of services to those who suffer from heart disease, cancer and stroke.

The great national voluntary agencies—such as the American Heart Association and the American Cancer Society—perform many services through their local chapters and affiliates and contribute significantly to research.

Indeed, the high level of health now enjoyed by most of the American people has been built by a powerful alliance of public, private and voluntary effort.

Yet we as a nation can and must aspire to still higher levels of health. To attain them—specifically to control the ravages of heart disease, cancer, and stroke—we must strengthen our alliance for health in a number of ways.

The toll of death and disability caused by heart disease, cancer and stroke is a national problem—a national disaster. Such a challenge demands a national response.

It is the conviction of the President's Commission *that our government has a profound responsibility, which it is not yet fully discharging, for leadership, stimulation, and support in the protection of the health of the American people.*

The national program envisioned in the detailed recommendations which follow is designed to provide the needed stimulation and support without violating the basic conditions and freedoms of our existing health partnership.

More specifically, our recommendations are based upon the following principles:

(1) *That the Federal Government shares in the responsibility for assuring that persons suffering from or threatened by heart disease, cancer and stroke have ready access to the benefits of the best in medical service based upon the products of scientific research;*

(2) *That the Federal Government has a major responsibility for strengthening and broadening the support of research which will generate new knowledge essential to the control of heart disease, cancer and stroke;*

(3) *That the Federal Government has a major responsibility for direct and diversified support of medical education and other programs designed to produce the health manpower upon which the control of heart disease, cancer and stroke depends.*

It is our conviction that the stronger national role involved in the Commission's recommendations in all three of these areas—service, research, and teaching—will enhance and make more productive the efforts of all members of the health partnership. Each public and private resource is indispensable to the achievement of better health for the American people.

Finally, and underlying the other principles, we believe:

That the nation can well afford and the people will enthusiastically support substantially increased expenditures intended to save lives today and produce more lifesaving knowledge for tomorrow.

The nation's resources are enormous and rapidly growing. Our Gross National Product passed $500 billion in 1960 and is spiraling upward toward $1 trillion. The projected annual increase in national productivity for the years immediately ahead is about $30 billion.

Of this increase, the Federal Government will receive an annual increment of some $5 to $6 billion per year.

Against this gigantic backdrop, expenditures for health cast a small shadow.

Disease costs the American people $35 billion per year, but we are investing only about $1 billion of our national funds in medical research.

The national program recommended by the Commission calls for a greater investment in the health of the American people than has thus far been made. Every commitment of resources for a given purpose requires decision. It requires assignment of priority.

What price, what priority, human life?

TOWARD THE CONQUEST OF HEART DISEASE, CANCER AND STROKE

A NATIONAL NETWORK FOR PATIENT CARE, RESEARCH AND TEACHING IN HEART DISEASE, CANCER AND STROKE

The first set of recommendations of the President's Commission would create a national network for patient care, research, and teaching in heart disease, cancer and stroke.

This program is designed to bring together the best in medical care and the best in medical research, region by region across the nation. It would result in two major benefits:

(1) *The saving of many human lives and the prevention of widespread disability,* by making the best in modern medical care readily accessible to people suffering from or threatened by heart disease, cancer and stroke in their own communities and regions;

(2) *The rapid development of new knowledge about heart disease, cancer and stroke,* by creating a greatly increased number of top-quality centers for the clinical and laboratory investigation of these diseases strategically distributed throughout the country.

In addition to these two major thrusts, which strike at the two most critical needs in the campaign against the three killer diseases, the proposed national network would contribute to the up-grading of all medical services. Each individual component of the network would serve as a teaching and training center, transmitting to the medical profession and to the public the latest developments in scientific medicine.

The proposed national network is based on the concept that the best patient care is associated with research. It is not envisioned as a totally new and separate pattern of medical service superimposed from above. Rather, it is designed to become a part of the existing fabric of medical services. Existing universities, community hospitals, and research institutes will be the focal points for the centers and stations proposed. In some areas, through the development of medical complexes, individual regional centers and stations will be related to and integrated with existing health resources.

The system is designed not to duplicate existing resources but to strengthen them.

The purpose of the entire system is to assist the doctor in practice in the care of his patient who is suffering from heart disease, cancer or stroke. It will make available to every doctor in the country the newest and most effective diagnostic methods and the most promising methods of treatment.

It will, in effect, link every private doctor and every community hospital to a national—and indeed worldwide—network transmitting the newest and best in health service. And at the same time it will make each doctor a contributor to

the worldwide research effort; for his observations will add to the total knowledge accumulated by the stations, centers, and research institutes.

The specific recommendations which follow, taken together, represent a major innovation.

They constitute a nationwide plan to fuse the worlds of medical research, medical education and patient care.

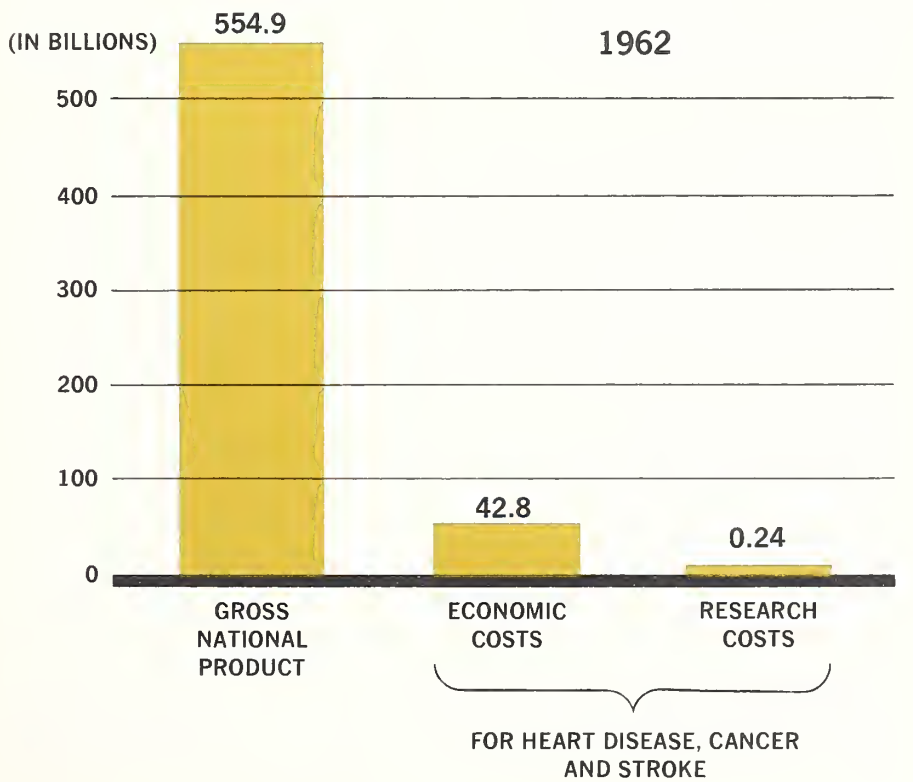
Regional Centers for Heart Disease, Cancer and Stroke

Recommendation 1. The Commission recommends the establishment of a national network of Regional Heart Disease, Cancer and Stroke Centers for clinical investigation, teaching and patient care, in universities, hospitals and research institutes and other institutions across the country.

Specifically, the Commission recommends:

A. That 25 such centers for heart disease, 20 for cancer, and 15 for stroke be established over a 5-year period;

B. That an Advisory Committee on Regional Centers be established by the Public Health Service to organize, develop, and review plans and projects dealing with the development of regional centers in the three categorical areas; the recommendations forthcoming from this Committee are to be transmitted to the appropriate National Advisory Council to aid the Council in making its recommendations to the Surgeon General regarding applications for regional centers.



C. That the following funds be appropriated to the appropriate units in the Public Health Service to initiate this program for a 5-year period in the various areas:

Type of center		Year				
		1	2	3	4	5
Heart Disease...	Number of new centers.	10	3	4	4	4
	Funds required*.....	25.0	24.5	32.1	38.9	45.7
Cancer.....	Number of new centers.	4	4	4	4	4
	Funds required*.....	50.0	90.0	150.0	150.0	160.0
Stroke.....	Number of new centers.	5	2	2	3	3
	Funds required*.....	12.5	12.0	16.0	20.0	25.0

*Figures in millions of dollars.

Description. Each of the proposed regional centers for heart disease, cancer or stroke would provide a stable organizational framework for clinical and laboratory investigation, teaching, and patient care related to the disease under study. It would be staffed by specialists from all clinical disciplines and the sciences basic to medicine necessary for a comprehensive attack on problems associated with that disease. These specialists would have at their disposal all necessary diagnostic, treatment, and research equipment and resources. The center would also provide bed support for the patients under investigation as part of their total care.

Such a center would permit the most comprehensive, effective and professionalized research effort possible.

Each regional center must have an allocation of space appropriate to the program to be mounted, permitting reasonable expansion. To establish such centers, nonmatching funds for the construction of new space and/or the renovation of existing space should be appropriated, in addition to funds for the provision of necessary equipment and staff.

Centers already exist, particularly in cancer, which can serve as a nucleus for the development of some of these regional centers. Investments in potential sites will be necessary in places where the nucleus for these facilities does not exist.

The centers would be strongly oriented toward clinical investigation and fundamental research. They would conduct training programs for personnel staffing the diagnostic and treatment stations and would also serve a teaching function for the medical community of the region.

Each center will require hospital beds as well as outpatient facilities. It will have areas for specialized care, and research beds related to laboratory facilities for specialized diagnostic studies and new treatments under investigation. In addition it will have operating rooms and other facilities for complex diagnosis and treatment.

The staff of each center must be large and varied enough to facilitate investigation and treatment in depth, utilizing multiple scientific methods. A Regional Heart Center, for example, might include internists, cardiopulmonary physiologists, cardiologists, peripheral vascular specialists, cardiac and vascular surgeons, biochemists, statisticians, epidemiologists, radiologists, and, in some cases, geneticists. Cancer centers would be staffed in similar depth and diversity incorporating the specialized disciplines necessary for cancer study. Stroke centers, many of which would be established in conjunction with heart centers so as to make joint use of staff and facilities serving their common needs, would also have specialists in the neurological disciplines.

In summary, each Regional Heart, Cancer, or Stroke Center would be established where possible in conjunction with a major existing medical institution. It would be staffed and equipped to conduct advanced and complex clinical investigation and related research, plus teaching services and high-quality patient care.

It would function as a regional resource for these services, interacting with the local diagnostic and treatment stations and with the other medical resources of the area.

A logical, organized program of research, teaching and patient care in a regional center can vitalize the interest in the care of the patient, make available the latest techniques and resources in modern therapy and discover new ones for application. By demonstration and professional education, the patients of a whole area may be benefited.

Rehabilitation Centers. In addition to these specific proposals for the creation of regional centers, the Commission strongly endorses the importance of similar centers in rehabilitation. Five such centers presently exist, supported by grants from the Vocational Rehabilitation Administration. Doubling the number of centers now receiving support and increasing the funding of each center as its program may require would provide vitally needed expansion of rehabilitation care, research and training, particularly to meet the needs of patients with heart disease, cancer and stroke.

Relation to Clinical Research Center Program. It should be noted that the proposal for categorical regional centers for heart disease, cancer and stroke represents an outgrowth and extension of an already successful program of the National Institutes of Health. The NIH Clinical Research Center Program,

now in its sixth year, has demonstrated on a modest scale the great potential of clinical research units in various parts of the nation.

The Commission considers, however, that its present proposal for categorical regional centers constitutes an urgently needed next step in advancing the attack against heart disease, cancer and stroke.

The time is ripe for the development of research, training and care facilities that would permit the broadest and most comprehensive attack attainable on the problems of heart disease, cancer and stroke. The Commission recommends, therefore, that the present "Clinical Research Center" program be continued and expanded, and that its name be changed to the Clinical Research *Unit* program to clarify the relationships between this existing program and the *Regional Center* program proposed herein.

Diagnostic and Treatment Stations

Recommendation 2. The Commission recommends the establishment of a national network of Diagnostic and Treatment Stations in communities across the nation, to bring the highest medical skills in heart disease, cancer and stroke within reach of every citizen.

Specifically, 150 such Stations are to be established for heart disease within a 5-year period; 200 for cancer; and 100 for stroke. In addition it is recommended that 100 Rehabilitation Units be created in association with many such Stations, to assure that the best in rehabilitative service is rendered to patients receiving diagnosis and treatment.

The number of Stations recommended is based on a careful assessment taking into account the number of existing facilities for each disease area, the national need and the feasibility of staffing the Stations within a 5-year period.

We recognize that the suggested number of Stations will not, in fact, saturate the entire country. There still will be many patients beyond practical access to these facilities. It is our intention that these will serve as pilot demonstrations stimulating still broader coverage under local initiative.

The Commission recommends that half of the Stations established for each disease area be located in medical centers, and half in community hospitals, to make maximum use of existing skills while assuring that excellence is effectively distributed geographically across the nation.

The Commission further recommends that an Advisory Committee be established in the Public Health Service to develop a national plan for the establishment of these Stations, to review applications for grants, and to evaluate the program in the fourth year to determine future needs for further program development.

It is recommended that the following appropriations be made to appropriate units in the Public Health Service to initiate this program for a five-year period in the various areas.

Type of unit		Year				
		1	2	3	4	5
Heart Disease....	Number of new units.	30	35	40	45	.....
	Funds required*.....	11.25	18.375	26.375	35.25	26.25
Cancer.....	Number of new units.	40	40	40	40	40
	Funds required*.....	15.0	30.0	45.0	60.0	75.0
Stroke.....	Number of new units.	20	20	30	30	.....
	Funds required*.....	7.5	11.0	18.25	23.5	17.5
Rehabilitation.....	Number of new units.	10	20	30	40	.....
	Funds required*.....	3.0	7.5	16.5	19.5	15.0

*Figures in millions of dollars.

Initial construction or renovation and equipment of these Stations should be supported with Federal funds on a non-matching basis.

Staffing and operating costs of the Stations should be borne in part by the Federal Government and in part by local resources. It is envisioned that such Stations could become self-supporting within a 10–15 year period.

Emphasis should be placed on local resources for the provision of care for medically indigent patients in a diagnostic and treatment unit. Patients other than the medically indigent should pay for services.

Description. A typical Heart Station would have the following principal objectives:

1. Immediate and emergency care for patients with acute cardiovascular emergencies.
2. Provision of diagnostic facilities for the screening of patients with cardiovascular, including peripheral vascular, diseases to determine whether they will require the more highly technical facilities available at the larger medical centers.
3. Outpatient services for patients with cardiovascular and peripheral vascular disease.
4. Stimulation of interest of medical students and practitioners.
5. Training of physicians in the community.
6. Education of the general public concerning prevention and treatment of heart disease.

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These Stations will include intensive care units for the emergency care of patients with heart disease. In addition, these Stations would provide limited laboratory facilities, an outpatient clinic, electrocardiographic and radiologic services. Patients requiring advanced diagnosis or treatment would be referred to the Regional Center equipped to perform it.

Each Cancer Station would have similar goals and be equipped and staffed to provide parallel types of service to patients and to the medical community. Each would require provision for cytological and histo-pathological laboratories to effect diagnosis. Team care at each Station would include radiotherapy and radioactive isotopes, chemotherapy, and the maintenance of a cancer registry with complete reporting. Each should have access to data processing and computer analysis.

Each Station should be in close contact with the Regional Cancer Center in order to obtain directly from these research centers information and training in newer methods of diagnosis and treatment.

The Stations will in turn convey information to other community hospitals and physicians and should also serve as part of a network of facilities available for collaborative clinical research programs carried out by the large cancer research centers.

To fulfill its graduate educational function within its own community, each diagnostic and treatment station must have resources to provide to the practicing doctors a 24-hour, 7 day-a-week specialist consultation service without charge. The diagnostic and treatment unit information service will have access to the information services provided by the regional centers, and through these centers to the total body of knowledge accumulated in a worldwide research effort.

The Stroke Stations will include intensive care units for the emergency care of patients with stroke. They should be established so that they may share certain facilities and personnel with Heart Stations. Therefore, it is desirable for the Stroke Stations to be in the same area of the hospital as the Heart Stations and to work closely with them, avoiding unnecessary duplication but supporting each other.

These Stations will include laboratory facilities, physical medicine and rehabilitation facilities, outpatient clinic and hospital beds, and provision for electroencephalographic, electrocardiographic, neurological, and emergency surgical services.

Development of Medical Complexes

Recommendation 3. The Commission recommends that a broad and flexible program of grant support be undertaken to stimulate the formation of medical complexes whereby university medical schools, hospitals and other health care and research agencies and institutions work in concert.

Specifically, the Commission recommends a major program of institutional grants to university medical schools for the creation of medical complexes which would involve participation by community hospitals and other health care facilities, by some of the regional heart, cancer and stroke centers and stations

developed in proximity to each medical center, and by other community agencies and institutions.

For this purpose, it is recommended that the Public Health Service receive appropriations as follows: First year, $25 million; second year, $37.5 million; third year, $50 million; fourth year, $62.5 million; fifth year, $75 million.

It is envisioned that approximately 10 medical centers would receive approval for such grants in the first year of operation, followed by 5 additional centers in each of the succeeding years. The average grant for each center would be $2.5 million.

Description. The network of Regional Centers and Diagnostic and Treatment Stations just described, each oriented toward high-quality services in connection with a specific disease, will greatly increase the accessibility of the best in medical practice across the nation.

The third recommendation of the Commission is designed to provide a means by which existing medical centers can expand their resources so that they can participate in the development of this national network.

The funds would be used by the medical center to transform itself into a medical complex serving a large community, metropolitan area or region. Funds could be employed in a variety of ways, such as the increase of staff to provide full-time faculty members for duty at affiliated community hospitals; augmenting staff in other ways to serve the community; setting up necessary administrative mechanisms; and the like.

The resultant complex would strengthen the community hospitals by allowing them to draw on the advanced and costly services available at the center without the need for duplication.

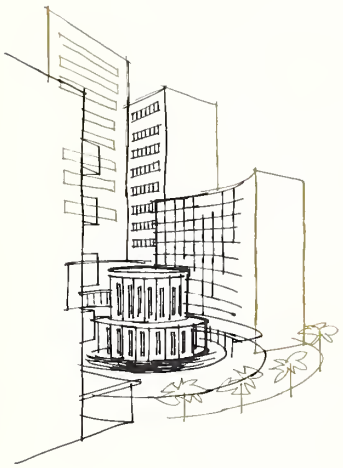
The system would provide an ideal base for a continuing education program reaching physicians and other health professionals in the region, and for coordinating all community services—including noninstitutional care—through a variety of cooperative and mutually supportive arrangements with existing agencies.

Development of Additional Centers of Excellence

Recommendation 4. The Commission recommends a program of developmental grants to medical schools to enable these institutions to improve their total capability for both academic and research programs for the ultimate purpose of creating a greatly increased number of true "centers of excellence" in medical education and research.

Specifically, it is recommended that appropriations of $40 million over a 5-year period, beginning with $3 million in the first year, be made to the Public Health Service for a program of nonmatching grants to be used by institutions at their discretion to strengthen various aspects of their academic and research programs.

This proposed program parallels an existing program of institutional development administered by the National Science Foundation and should be carefully coordinated with that agency. Its overall purposes would be:



(1) To raise a number of medical institutions of demonstrated potential to a level of excellence comparable with the few outstanding medical centers of the nation. This would create new foci for the development of medical complexes, and would also correct in part for the tendency to channel ever-higher proportions of available funds to the few outstanding institutions;

(2) To strengthen the fundamental resources for medical education and medical research and to disperse throughout the country the standards of excellence conducive to the most effective preparation of medical manpower required to bring about a substantial reduction in the burden and incidence of heart disease, cancer and stroke.

The application for such a grant should be accompanied by a detailed plan indicating the purpose to which the funds would be applied as it relates to the objective of this program. Grants would be reviewed by a peer group of medical educators and distinguished citizens.

A National Stroke Program Unit

Recommendation 5. The Commission recommends the establishment of a National Stroke Program directed by an administrative unit to be created within the appropriate unit of the Public Health Service to coordinate the numerous existing and proposed activities in the field of stroke.

This Unit should have a full-time permanent staff with responsibility for development of a comprehensive program of research and training in stroke. Its activities would include administration and coordination of the programs for Regional Stroke Centers and Diagnostic and Treatment Stations already described, plus the Specialized Stroke Research Units recommended in Chapter V of this Report and the training activities related to stroke described in Chapter VI. Its work would be closely coordinated with the work of the voluntary agencies active in the stroke field, such as the National Stroke Program of the American Heart Association.

The National Stroke Program should be developed with the advice of the Joint Council Subcommittee for Cerebrovascular Diseases of the National Advisory Heart Council and the National Advisory Neurological Diseases and Blindness Council.

There are compelling reasons for the establishment of a full-fledged and coordinated National Stroke Program.

The underlying reason is that stroke has been a seriously neglected area of study in the past. This neglect has been based largely on the false assumptions that stroke was a hopeless disease and that it was a later-life form of coronary artery disease.

Recently there have been substantial advances in knowledge which indicate that many—perhaps most—strokes are foreseeable and preventable, and that much can be done for stroke victims. Scientific evidence indicates that cerebral thrombosis and hemorrhage may be a different disease process from atherosclerosis and hypertension elsewhere in the body. Moreover, it is clear that the care of stroke patients requires special forms of cooperation among such medical

specialties as neurology, cardiology, surgery, physical medicine, and rehabilitation.

The Commission considers the development of a National Stroke Program imperative if we are to achieve the progress of which we are capable against this major killing and disabling disease.

To operate this unit, $1 million should be appropriated annually for the first two years with subsequent annual increases until $2 million is reached in the fifth year.

TOWARD THE CONQUEST OF HEART DISEASE, CANCER AND STROKE

APPLICATION OF MEDICAL KNOWLEDGE IN THE COMMUNITY

Many individuals, agencies and groups contribute to the health services received by heart disease, cancer and stroke patients in American communities.

State and local health departments, in addition to their traditional and better known responsibilities for the control of communicable diseases, conduct active programs to serve the chronically ill as well.

Voluntary agencies—such as the local affiliates of the American Cancer Society and the American Heart Association—assist in many ways. There are also the professional organizations—the local medical societies and others—and the various groups providing specific kinds of care such as visiting nurse associations, nursing homes, and the like.

Each has a special part to play in the delivery of health services.

Manpower and facilities for the delivery of top-quality health care are in short supply in virtually every community. Therefore, the efficient use of existing resources is imperative. Yet in many communities the reverse is actually the case. Instead of coordination, there is duplication of services and facilities in some areas, while serious gaps exist in others.

There may be several large general hospitals, furnishing more beds for acute care than can possibly be utilized by the community, while serious shortages exist in beds for long-term care and programs for those patients who can best be cared for in their own homes. Several hospitals may possess costly equipment—such as cobalt devices for cancer care, or heart-lung machines—each being used only once or twice a week. Teams of highly skilled people required to work with this equipment are also standing idle.

A beginning response to these problems can be seen in a few of the nation's more progressive and active communities. The concept of "areawide planning" is being implemented through councils of social agencies, utilization committees, and community health or patient-care councils. These voluntary organizations attempt to achieve coordinated efforts on the part of various independent agencies and individuals concerned with the health and medical needs of the community's citizens.

Such endeavors are of the utmost importance if we are to realize our aspirations for programs that will have maximum impacts on heart disease, cancer and stroke. Independent and often competing activities of hospitals, health departments, and medical practitioners—each working in isolation and often at cross purposes—are not in the best interest of the consumers of health services, the health profession, or the nation.

The national network proposed in the previous chapter will do much to strengthen and coordinate community services for heart disease, cancer and stroke.

But much more needs to be done if the full-scale attack on these diseases is to be fully effective.

The recommendations in this chapter are designed to assure this success by stimulating and supporting community programs and by encouraging the communication of health knowledge to the practicing physicians and to the public.

Community Planning Grants

Recommendation 6. The Commission recommends a special program of incentive grants to communities to stimulate the development of a system for the planning and coordination of health activities.

Specifically, it is proposed that there be established within the Community Health Services and Facilities Act Program of the Public Health Service, matching grants to be awarded to community agencies to support and stimulate community-wide planning activity. Prerequisites for the receipt of such a grant would be representation from the major educational establishments, the official and voluntary health services, the major professional societies, and the civic leaders whose participation is essential to the success of any truly effective coordination and planning on a community basis.

One of the major factors which inhibits the maximum availability of health services relating to heart disease, cancer and stroke is the lack of coordination of services within communities. Failures in coordination result in services that are uneven in quality and often inaccessible to those who need them most. Therefore, it is imperative that some positive steps be taken to encourage and stimulate community planning and coordination of health services programs on a widespread basis.

The program proposed would not only do a great deal toward assuring the availability of the best in health services for heart disease, cancer and stroke victims but would also help the communities to participate more effectively in the development of the university medical complex in its area.

An appropriation of $1 million annually is recommended to provide the incentive to as many communities as possible to undertake such a program of planning and coordination.

Community Health Research and Demonstration

Recommendation 7. The Commission recommends that greatly increased emphasis and support be given to programs of community health research and research training within the Public Health Service, and that the program of demonstration projects under the Community Health Services and Facilities Act of 1961 be freed from existing appropriations ceilings, more adequately funded, and more liberally interpreted.

It is vitally important that we find ways of using existing manpower and other resources as efficiently as possible. Indeed we cannot meet the challenge of heart disease, cancer and stroke unless we improve methods for extending the accessibility and delivery of health services in the community.

Research in community health offers one highly promising avenue for efficient use of resources.

Scientific methods can be applied in the laboratory of the community. Epidemiologic research can reveal patterns of disease distribution which in turn permits a concentrated attack where it will do the most good. Behavioral research, economics research, and research in public health administration all can contribute to effective planning and programing. But community health research is a very new field. Few people are trained to do the job. A major investment in research training and support of promising research projects in this field can be expected to pay important dividends. Accordingly it is recommended that the present appropriation for this purpose be increased by $5 million for the first year, increasing annually until an increase of $10 million in the fifth year is reached.

The Community Health Services and Facilities program, despite the limited number and scope of projects that it has been possible to support, has proved that demonstrations of experimental approaches to the delivery of health care are useful and practical. The Act authorizing this program was designed to solve the problem of community organization for health service. But it has been narrowly defined and inadequately funded.

Freed from its existing restrictions, this program could make a major contribution to the attack on heart disease, cancer and stroke.

Support of Community Programs

Recommendation 8. The Commission recommends that appropriate units of the Public Health Service be given authority and funds for programs of project grants to community agencies, such as public health departments, voluntary agencies, and others, and that the Vocational Rehabilitation Administration launch a 5-year development program to expand its rehabilitation programs for victims of heart disease, cancer and stroke.

Specifically, the Commission recommends:

A. That the Public Health Service be authorized and funded to initiate project grants to public and other nonprofit organizations for studies, experiments, feasibility trials, demonstrations, and training in their respective fields of interest and that a special grants program be initiated by the Public Health Service in the field of medical rehabilitation.

The project grants envisioned in this recommendation would stimulate State and community agencies to deliver expanded and more effective services to patients suffering from heart disease, cancer and stroke, thereby speeding the application of scientific knowledge to the people who need it. These categorical project grants would provide incentive and encouragement for community programs in such areas as the early detection of incipient heart disease, cancer and stroke; effective systems of referral for patients; application and training in the use of medical rehabilitation techniques for heart, cancer and stroke patients; and the like.

The following table indicates the appropriations necessary to initiate the new Public Health Service programs and expand existing ones for a 5-year period.

Area	Year				
	1	2	3	4	5
Heart Disease*	1.5	3.0	4.5	6.0	7.5
Cancer*	1.5	3.0	4.5	6.0	7.5
Stroke*	1.5	3.0	4.5	6.0	7.5
Medical rehabilitation*	1.5	3.0	4.5	6.0	7.5

*Figures in millions of dollars.

B. The program recommended for the Vocational Rehabilitation Administration would include (1) a new system of project grants for State vocational rehabilitation agencies to provide complete rehabilitation services to persons with disabilities resulting from heart disease, cancer and stroke; (2) the construction of vocational rehabilitation centers and sheltered workshops; (3) matching fund programs with cities and counties to develop local services; and (4) legislative authority liberalizing the requirements in the existing State-Federal rehabilitation program.

The Commission recommends that $25 million be appropriated to the Vocational rehabilitation Administration for a 2-year period to achieve this expansion.

Statewide Programs for Heart Disease Control

Recommendation 9. The Commission recommends that the Public Health Service be given authority and funds to establish and maintain coordinated Statewide laboratory facilities necessary for heart disease control programs.

A total appropriation of $8.5 million over a three-year period is recommended for this purpose—$2.5 million for each of the first two years and $3.5 million for the third.

The laboratories established through this program should be designed to perform laboratory services related to heart disease control. These laboratories should form a part of a coordinated Statewide program of heart disease control, headed by a specific unit within the State health department. Such a program,

to be successful, must coordinate the efforts of the numerous public and voluntary agencies whose work impinges on heart disease control and must also collaborate closely with the private physicians of the State.

The objectives of this Statewide laboratory network are several:

(1) The grouping of beta-hemolytic streptococci. Rheumatic fever is potentially preventable through prompt identification and immediate treatment with an appropriate antimicrobial agent of patients suffering from beta-hemolytic streptococcal infections. Each State should have coordinated laboratory facilities to identify the Group A beta-hemolytic streptococcus organism. Where such facilities exist, they have proved a tremendous boon to practicing physicians and have facilitated rheumatic fever control programs in that State.

(2) The provision of services for the laboratory control of patients receiving anticoagulant agents. A large number of patients in the United States are currently receiving anticoagulant drugs; it is probable that the number will grow in the future. The dosage of these drugs must be tailored to each patient individually and the dosage regulated by carrying out appropriate blood tests at frequent intervals. In many areas of the country, this service is carried out by hospitals and private laboratories. In other areas, however, patients could receive this type of medication if this service was available and convenient. This Statewide laboratory network would conduct well standardized and controlled tests which could help other laboratories check their methods for acceptable accuracy and also provide laboratory service in areas where it is needed.

(3) In conjunction with the Heart Disease Control Program (HDCP) laboratory at the Communicable Disease Center, (CDC), to provide the service of standardization of chemical laboratory tests to hospital and private laboratories in the country. The HDCP laboratory at CDC is performing this service for laboratories all over the United States and abroad at the present time. This Statewide network of laboratories could serve as local agents for this valuable program. As such, these local laboratories could also perform chemical determinations and participate in large local and national epidemiologic studies in cardiovascular disease; in this sense, these laboratories would act as a valuable resource for certain research programs of national interest.

It must be stressed that the development of such a laboratory network to perform the above services would make it possible to achieve an immediate, specific and measurable impact in reducing death and disability.

Each State should, of course, assess its own needs. The Heart Disease Control Program of the Public Health Service should have the authority and specifically earmarked funds to assist the States in setting up and operating the needed facilities.

National Cervical Cancer Detection Program

Recommendation 10. The Commission recommends the development of a national program for the early detection of cervical cancer.

This program would have two major components:

A. A national education program for the general public so that all women are aware of the availability of the cervical cancer screening test. This should be conducted by the Public Health Service in cooperation with the voluntary health agencies, such as the American Cancer Society.

B. A cervical cancer detection program directed at those 8 million women aged 25 years and over who are admitted to hospitals in the United States each year. The Commission feels that such a hospital-centered screening program will be most economical, will reach the high-risk, low socioeconomic group and offers the greatest potential for rapid public and professional education.

It is recommended that $5 million be appropriated to the Public Health Service in the first year and increased by $2½ million each year for a 3-year period, to provide grants to hospitals participating in this program. An Advisory Committee should be appointed to help plan the development of this program, to review it after the second year, and to plan for its future development.

Total support for cytological examination should be given to hospitals providing care for medically indigent patients, and partial support to hospitals providing care to patients who do not have health insurance or other resources to cover cytological examinations.

All other hospitals should include this examination as part of the routine physical examination and the cost of cytology should be included with the cost of other laboratory tests.

In providing these grants, consideration should be given first to hospitals providing care for the indigent and the medically indigent.

This national cervical cancer detection program is an intensive effort aimed at a very specific target.

Each year many thousands of women die of cancer of the cervix. Most of these deaths are unnecessary, for the disease can be detected easily at a stage in which it is almost invariably curable.

There is no excuse for further delay in launching a major attack that can reduce the death toll from this form of cancer virtually to the vanishing point.

Continuing Education of the Health Professions

Recommendation 11. The Commission recommends that appropriate units of the Public Health Service, and the Vocational Rehabilitation Administration, be provided with funds and any additional authority that may be necessary to spearhead a national program for the continuing education of the health professions.

Specifically, the program envisioned has three major elements, as follows:

A. The Public Health Service should be provided with funds and additional authority if necessary to stimulate and support, through grants, contracts, or other means, demonstration projects and experiments directed by universities, medical schools, hospitals, and other appropriate agencies, designed to make scientific knowledge on heart disease, cancer and stroke and other subjects systematically and conveniently available to practicing physicians and other health professionals.

The scope of this program should also include conduct and support of research projects designed to develop and experiment with new methods of continuing education, use of various media, and methods of evaluating their actual impact in upgrading medical practice. Appropriations of $2 million for the first year, $4 million for the second and $6 million for the third are recommended.

B. The community hospital occupies a particularly strategic position in carrying continuing education programs directly to the practicing physician. To organize and carry out such programs a given hospital should appoint a full-time Director of Medical Education plus supporting staff. Members of the attending staff of the hospital should be encouraged to attend courses and take longer additional training whenever possible.

Though, ideally, all community hospitals with 300 or more beds should ultimately mount such a program, it is recommended that such units be established and supported in 100 of these hospitals throughout the United States on a pilot demonstration basis; if successful, the number of units can be increased. It is estimated that about $75,000 per year would be needed to carry out a program of this type in each hospital of this size. A total of $7.5 million annually would be needed for this program.

C. An additional amount of $600,000 per year for 5 years should be appropriated to the Vocational Rehabilitation Administration to provide grants to key medical and health institutions and agencies throughout the country for support of short-term training courses, seminars, conferences, and workshops in rehabilitation services for heart disease, cancer and stroke patients.

Continuing education is a categorical imperative of contemporary medicine. Without a large-scale, effectively organized effort, the worlds of science and practice will spiral still farther apart. The gap between what is known and what is received by patients will be harder and harder to bridge.

The greatest single obstacle to a cohesive program of continuing education for the medical profession is time. The second is diversity of interest and needs. The third is the fact that continuing education, although it is recognized as a critical problem in medicine today, is not the primary responsibility of any significant segment of our national health resource.

Medical schools—the logical locus for the major effort—are correctly preoccupied with undergraduate education first and research second; continuing education, if it receives any attention at all, must settle for what is left of already inadequate resources. Similarly, community hospitals could contribute greatly to the continuing education of community physicians, but their first job is to care for the sick. Professional societies have many other responsibilities.

The Federal Government clearly has a role to play in helping to forge a national continuing education effort, by assisting all the available resources in giving due attention to this problem.

Public Information on Heart Disease, Cancer and Stroke

Recommendation 12. The Commission recommends that the Federal government, primarily through the Public Health Service, recognize that public

information is a primary responsibility and a major instrument for the prevention and control of disease, and that this activity be encouraged and supported on a scale commensurate with its importance.

Application of medical knowledge in such fields as heart disease, cancer and stroke depends on the initiative and cooperation of an informed public. This is true of every step in the process, from prevention and early detection to rehabilitation—each of which depends on the active participation of the patient and his family.

Specifically, the following projects and programs are recommended:

A. The Public Health Service should be authorized, and funds should be appropriated, to contract with commercial television producers for the production of twelve 30-minute documentary films each year of the highest quality, on subjects related to heart disease, cancer and stroke and such other subjects as are deemed desirable.

Each film should be budgeted at or about the level of $150,000 to assure writing and production that will make the films competitive with the best of commercial television, thereby encouraging their use in prime viewing hours. This price should include a sufficient number of prints to assure widespread use on local commercial television outlets across the nation. The contract should also provide for the full participation of the producer and his organization in the marketing of the films. The Public Health Service, in conjunction with non-Federal scientists and physicians designated by the Service, should have full control of the content of each film. The film should be available for commercial sponsorship within a predetermined range of appropriate product classifications. The method proposed—which consists essentially of a Federal investment in communications talent—would cost about $1.8 million per year.

B. The Public Health Service should be authorized, and funds should be appropriated, to the National Medical Audiovisual Center—subsequently described in connection with Recommendation 31—to support through appropriate mechanisms, such as grants or contracts, the development of effective television programing in the health field on the nation's educational television stations. The sum of $1 million per year is recommended as a beginning figure.

Educational television (ETV) programs reach school audiences at all levels from primary school through college. In many communities the ETV program is viewed widely by the adult intellectual and civic leadership as well. It represents an excellent medium for attracting young people to health careers, for establishing and maintaining desirable health habits, and for stimulating desirable communitywide health activities. In many areas, ETV facilities can also be used for continuing education of health professionals.

C. The funds appropriated for the Office of Information and Publications in the Office of the Surgeon General should appear as a budgetary line item. They should be increased by $750,000 per year to finance such additional activities as the development and production of a health yearbook similar in scope and quality to the Agricultural Yearbook; the creation of materials for free public service announcements on heart disease, cancer, stroke and other

subjects for use by radio, television, magazines, and other media; and other purposes.

D. The Public Health Service should be provided with funds to initiate the development of a Center for Research in Health Motivation. In addition to specific behavioral studies directed at the individual decisionmaking process in changing patterns of living, the Center would analyze the contents of public campaign materials with reference to their effectiveness and influence upon behavior, and it would hopefully concentrate particular attention upon hard-to-reach population groups which reject existing educational campaigns emphasizing individual initiative and changes in living patterns. It is estimated that $500,000 per year would be necessary to undertake the support of such a Center.

E. The Commission strongly endorses the conclusions and recommendations of the Surgeon General's Advisory Committee on Smoking and Health which, in addition to confirming previous reports, stated that smoking is a serious hazard to health and indicated the need for more aggressive programs in this area.

It seems apparent that the reduction of cigarette smoking offers great possibilities for the prevention of illness, disability, and premature death in this country, with regard to both cancer and cardiovascular disease.

Because public information and education are primary instruments for the attack on this problem, the Commission recommends that the sum of $10 million be appropriated to the Public Health Service over a three-year period for a comprehensive national program of education and public information regarding the hazards of cigarette smoking. The program should be aimed at the education of children, adults, physicians and educators with the assistance of State and local community agencies. A network of smoking control clinics should be provided to assist those who desire to give up smoking. New and more effective educational material should be developed.

It is further recommended that the present budget of $500,000 for public information and education in the Cancer Control Program of the Public Health Service be increased to $1 million for the first year, $1.5 million for the second, and $2 million for the third to permit increased effectiveness in informing the public about cancer and its prevention and control.

TOWARD THE CONQUEST OF HEART DISEASE, CANCER AND STROKE

THE DEVELOPMENT OF NEW KNOWLEDGE

The conquest of heart disease, cancer and stroke requires the continuation and expansion of our highly productive medical research effort in the years ahead.

Today's successes in detection, treatment and cure sprang from yesterday's research. But many problems related to these three diseases remain beyond our scientific capability. Of these, a large number appear to be just outside our grasp. We stand on the threshold of further advances.

To cross this threshold as soon as possible—to take advantage of the tremendous momentum built up by our biomedical research enterprises in the recent past—certain new elements should be added to our existing scientific resources. In addition, current procedures need to be strengthened or modified to assure ever-increasing productivity of new life-saving knowledge.

The national network of regional centers, each primarily oriented toward the solution of a specific disease problem, will generate and verify a tremendous amount of new information on heart disease, cancer and stroke.

But there is also the need for a more general research attack on the fundamental problems of human biology, to which all the sciences basic to medicine can contribute. In addition there is need for highly specialized avenues of research related to heart disease, cancer and stroke.

Therefore, other types of research institutions are recommended to supplement the products of the centers.

Moreover, the Commission has examined with great care the overall program of research support provided by the Federal Government. In our view, the diversity of funding devices that has developed over the years to support biomedical research and training is one of the nation's greatest strengths. Clearly, the variety of available mechanisms offers flexibility of support and provides institutions and investigators with an opportunity, within limits, to develop programs consonant with their needs. Indeed, the Commission recommends that Federal agencies which support biomedical research continue to do so by diverse means. At the same time, existing procedures should be strengthened and new modes of support should be developed as these are identified and found to be suitable.

The Commission's recommendations for the development of new knowledge are designed to add further impetus to the powerful forward thrust of biomedical research.

Biomedical Research Institutes

Recommendation 13. The Commission recommends the establishment of 25 non-categorical biomedical research institutes at qualified institutions throughout the country.

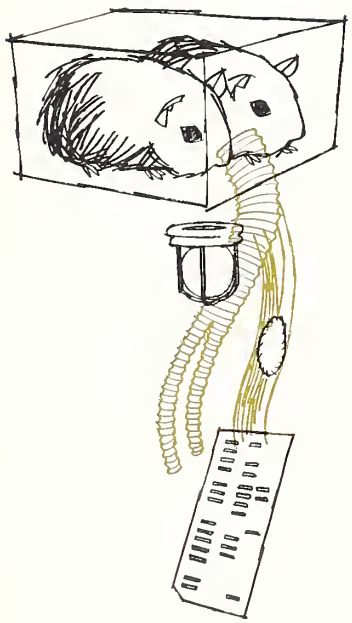
The following table indicates the appropriations that need to be made to the appropriate unit of the Public Health Service to initiate this program for a five-year period:

	Year				
	1	2	3	4	5
Biomedical Research Institutes:					
Number of new Institutes	5	5	5	5	5
Funds required*	7.5	15.0	22.5	30.0	37.5

*Figures in millions of dollars.

The Commission recognizes the importance and promise of non-categorical biomedical research. Indeed, such research is essential to basic understanding of heart disease, cancer and stroke. Clues of great significance, coming from such endeavors, can be used effectively by research groups investigating specific disease problems.

For example, through such research, we can hope to attain the more detailed understanding of the living cell which may reveal the nature of the delicate change in the balance of cellular activities which manifests itself as cancer. Hopefully, also, there may be an unraveling of the next layer of understanding—the manner in which highly specialized cells such as those of the brain, kidney, or heart perform the specific functions which, uniquely, they contribute to the total living organism.



In parallel we can hope to witness revelation of the manner whereby the nervous and endocrine systems coordinate and integrate the entire organism. And with such information in hand, incisive understanding of disease, i.e., disturbances of this orderly functioning, may be expected.

Such comprehensive biological understanding will, of course, greatly advance our hope for control of the wide variety of diseases to which man is heir, including cancer and cardiovascular diseases which combine to account for about 70 percent of adult American mortality.

Thus, the development of a number of university-based biomedical research institutes, at qualified institutions throughout the country, would strengthen the national biomedical research effort and add substantially to progress in the fields of heart disease, cancer and stroke.

Specialized Research Centers

Recommendation 14. The Commission recommends the establishment of Specialized Research Centers for intensive study of specific aspects of heart disease, cancer and stroke to supplement the research and training efforts of the regional centers previously described.

Specifically, at least 10 such Centers in heart disease, 10 in cancer, and 10 in stroke should be established in various health and medical research facilities throughout the country over a 5-year period.

In addition, it is recommended that three Bioengineering Centers and three Rehabilitation Biomedical Engineering Research Centers be established over a 5-year period in order to take advantage of the potential offered by bioengineering research in heart disease, cancer and stroke.

At the same time, there is an urgent need for centers for in-depth research and training in toxicology. It is recommended that serious consideration be given to establishing one such center during the next 3 years, with the understanding that the needs for more centers in this area be reevaluated at the end of 3 years.

In order to develop this program of Specialized Research Centers, nonmatching funds should be appropriated for construction and/or renovation and for the provision of the necessary equipment and staff. The Advisory Committee on Centers referred to in connection with Recommendation 1 would organize, develop, and review plans and projects of these Specialized Research Centers and transmit their recommendations to the appropriate National Advisory Council.

The following table indicates the appropriations necessary for the appropriate units in the Public Health Service to initiate this program of Specialized Research Centers for a 5-year period in the various areas:

Type of Center		Year				
		1	2	3	4	5
Heart Disease.	Number of new centers....	2	2	2	2	2
	Funds required*.....	0.6	1.2	1.8	2.4	3.0
Cancer.....	Number of new centers.....	2	2	2	2	2
	Funds required*.....	0.6	1.2	1.8	2.4	3.0
Stroke.....	Number of new centers.....	2	2	2	2	2
	Funds required*.....	0.6	1.2	1.8	2.4	3.0
Bioengineering.....	Number of new centers.....	1	1	1	.....	....
	Funds required*.....	1.25	1.6	2.0	1.5	1.5
Rehabilitation Biomedical Engineering.	Number of new centers.....	1	1	1	.....	....
	Funds required*.....	1.0	1.5	2.0	1.5	1.5

*Figures in millions of dollars.

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The centers proposed here would bring together the combined talents of a multidisciplinary staff for study of special problems related to heart disease, cancer and stroke.

For example, in the field of heart disease, centers designed for in-depth research and training might be established in epidemiology, genetics, thrombosis and fibrinolysis, pharmacology (especially for natural products), etc.

In cancer, specialized centers of this type might be established in epidemiology, virology, carcinogenesis, animal cancer, cytopathology, radiobiology, clinical pharmacology, immunology, enzymology, radiation therapy, nuclear medicine, etc.

Examples in the stroke field might be epidemiology, instrumentation for cerebral blood flow and diagnostic tests, experimental cerebrovascular surgery (especially in primates known to develop cerebral atherosclerosis), etc.

Specialized research and training in bioengineering in the three categorical areas and in rehabilitation offer great potential.

Research Project Grants

Recommendation 15. The Commission endorses the existing system of review of research project grants by study sections and advisory councils at the National Institutes of Health and recommends intensified and expanded support of research in heart disease, cancer and stroke.

Specifically it recommends:

A. That a total of $40 million be appropriated to the National Heart Institute, $40 million to the National Cancer Institute, $15 million to the National Institute of General Medical Sciences, and $10 million to the National Institute of Neurological Diseases and Blindness in a 3-year period over and above current appropriations to these Institutes for research project grants.

B. That NIH be allowed to use a mechanism whereby funds appropriated for special-purpose programs would not lapse if unspent at the end of the fiscal year.

C. That several important areas of research be given special emphasis because of the valuable contribution in the past and their high potential for the future. For example, epidemiological studies provide evidence which may lead to the identification of factors causing a specific disease or condition.

Of vital importance is the strong support of broad clinical field trials of drugs and other methods of treatment. As we have emphasized a number of times, there is a critical lag between the research discovery of a new medication and the rapid evaluation of its effectiveness against a particular form of disease. We must wait too long while individual investigators report their limited findings in technical publications which print articles 12 to 18 months after their submission.

The broad field trials of the efficacy of the Salk vaccine serve as a model of the quick application of an important research finding to the immediate prevention of crippling disability and death. We must mount similar clinical trials of promising therapies in the fields of heart disease, cancer and stroke. Clinical trials of this nature are expensive and require the collaboration of many institutions, but there is no more effective way of getting to all of our people the life-saving and life-enhancing bounty of medical research.

D. That $10 million be appropriated to the Vocational Rehabilitation Administration for the first year, with annual increases until $12 million is reached in the third year, for research in rehabilitation of persons with heart disease, cancer and stroke.

The research project grant system, whereby individual scientists receive support for projects which have been reviewed and judged worthy by their peers from other scientific institutions, is the cornerstone of Federal participation in medical research. It has demonstrated its effectiveness and value over a period of years.

The Commission bases its recommendation for additional funds to support research project grants in heart disease, cancer and stroke on three factors: (1) The overriding seriousness of these problems and their impact on American life; (2) the highly favorable prospects for accelerated success in research discovery in these fields based upon previous developments and work now in progress; and (3) the fact that the American research resource is sufficiently advanced and developed to be capable of using these additional funds wisely and productively.

The Commission feels strongly that budgetary increases for research support should be based, not on arbitrarily applied "percentage increments" from year to year but rather on actual research needs and capabilities for productive use of funds within each scientific field.

Contracting Authority for Research and Development

Recommendation 16. The Commission recommends that existing Public Health Service authority to contract for research and development be broadened and special funds be earmarked for the use of this mechanism.

Specifically, the Public Health Service should be authorized:

A. To make advance payments on contracts as a means to assist contractors in initiating new and complex technical operations;

B. To pay for the cost of construction involved in and essential to the successful accomplishment of the terms and purposes of a contract:

C. To commit contractual support for advance periods upward to five years to enable contractors to make substantial investment in facilities and staffs frequently required for major contract operations with confidence of adequate recovery of costs and reasonably stable operations.

It is further recommended that $15 million over the next 3 years be appropriated to the National Heart Institute for contracts for research and development in the field of heart disease.

Contracting for research and development is an effective mechanism for financing major projects such as, for example, the development of an artificial heart. As has been noted previously, this project is within the realm of immediate feasibility, provided a major scientific development program is mounted on an adequate scale. In such an undertaking, very substantial initial investments are required from research institutions and especially from private industry.

Existing Public Health Service contracting authority, delegated by the General Services Administration, is inadequate in several specific ways for

effective support of such endeavors. The Commission's recommendations would greatly enhance the use of this mechanism and thereby accelerate vitally important research.

General Support for Research

Recommendation 17. The Commission recommends that the existing General Research Support Grants Program of the National Institutes of Health be expanded as rapidly as possible to a level of 15 percent of the total NIH research and training budget and that the program be altered to increase its effectiveness.

Specifically, the Commission recommends:

A. That graduate schools engaged in biomedical research, supported by grants from NIH, should be permitted to receive grants under the general research support program; and

B. That general research support grants should be awarded in two categories: (1) Unrestricted funds to be devoted to research, as at present, and awarded on a formula basis; and (2) negotiated awards, based on documented applications, to defray the direct and indirect costs of the supporting organization and services provided by each institution to facilitate the conduct of research and which are not ordinarily chargeable as indirect costs.

The National Institutes of Health have carried out a program of grants to certain institutions for the general support of research for several years. The program is designed to assist institutions in achieving balanced research and teaching programs and in meeting rising costs associated with large-scale research programs based on project grants to individual faculty members. It is also intended to help institutions in expanding their physical resources for research and initiating pilot research in new areas—two undertakings which are extremely difficult to finance out of general operating funds.

The program has been highly successful in its initial phase. The Commission feels that its continuation, expansion and extension are important to the national research effort against heart disease, cancer and stroke.

Recommendation 18

The Commission recommends that the Federal Government develop a standard Government-wide policy for payment of the full costs attributable to research grant awards.

The Commission is convinced from its studies that the failure to pay the full costs of research through grant awards is a real deterrent to the further development of research potential. Because of the great amount of material in Congressional and administrative reports on this subject, it is not necessary to repeat the basic information in this report.

One of the major policies recommended by the Commission is that the Federal Government has the responsibility for continuing and broadening its support of research which will generate new knowledge essential to the control of heart disease, cancer and stroke. Therefore, it is strongly urged that a policy be adopted for the payment of the full costs attributable to a research grant under a standard Government-wide approach.

TOWARD THE CONQUEST OF HEART DISEASE, CANCER AND STROKE

EDUCATION AND TRAINING OF HEALTH MANPOWER

Many factors combine to increase the demand for additional manpower across the entire range of the health sciences. The expanding population, the rapid growth of its aging component, and other social forces are creating demands for medical care far beyond the present capacity of practicing health professionals. The swift growth of biomedical science creates parallel demands for increasing numbers of highly trained scientists. Moreover, developments in both research and the practice of medicine have led to the creation of new technical and supportive disciplines—essential to high-quality work—which are in very short supply.

The education of a physician or a research scientist requires many years. This long lead time precludes overnight attainment of manpower goals. But action now is essential if we are not to drop still further behind. Faced with overwhelming needs and inadequate resources, the Commission recommends programs of intensive effort for manpower development.

These involve Federal participation—to a degree not previously recognized as desirable or necessary—in (*a*) expanding the basic resources and facilities for educating and training health personnel, both professional and sub-professional; (b) providing increased opportunities for education and training to recruit more promising young people into the health occupations; and (c) increasing the effectiveness of the highly skilled health manpower now available.

Trained manpower devoting its full time and talent to problems of heart disease, cancer and stroke is an absolutely essential element of progress against these diseases.

This concentration cannot be achieved entirely or even principally at the expense of the existing total manpower pool, without seriously crippling our national medical effort. The objectives outlined here simply cannot be realized without increased numbers of physicians, dentists and medical scientists.

Therefore, the Commission recommends a program of forthright support of medical education. The specific recommendations which follow and those dealing with medical school support in Chapter Three are component parts of this fundamental declaration of policy.

Expansion of Resources for Preparation of Health Manpower

Recommendation 19. The Commission recommends that legislation be sought to permit forthright support of medical education, this program to include formula grants to the health professions schools. Immediately, there should be full utilization of the Health Professions Educational Assistance Act of 1963 and the Nurse Training Act of 1964. The Commission further recommends substantially greater and more diversified Federal support of programs

designed to increase the supply of physicians, dentists, and medical scientists.

Specifically, the Commission recommends:

A. That the ceiling on appropriations in the Health Professions Educational Assistance Act be eliminated and that a several-fold increase in appropriations be provided so that adequate facilities will be available to all schools capable of expanding their output of physicians and to offer further stimulus to the development of new schools;

B. That active consideration be given to a program of Federal support for the creation of 2-year medical schools in existing colleges, to achieve the most rapid increase in the number of physicians in training who could then be placed without substantial difficulty for the clinical portion of their training in existing medical schools or community hospitals with adequate teaching staffs.

It is reliably estimated that as many as 2,000 additional spaces could be made available in existing medical schools if funds were available under the Health Professions Educational Assistance Act to facilitate their expansion. Schools have expressed their intent to request grants totaling more than one-half billion dollars as compared with an appropriation ceiling of $35 million. Most of these expressions of intent refer to expansion of existing facilities rather than construction of new schools. There are comparable demands for expansion of dental and public health schools. In the Commission's view it is shortsighted and tragic in the extreme to frustrate the basic intent of the Health Professions Educational Assistance Act by an arbitrary limitation of funds which, in effect, makes it impossible to utilize to the fullest extent the nation's capacity for medical and dental education.

In addition, it has been estimated that from 2,000 to 3,000 vacancies exist in medical schools for third-year students. The creation of two-year medical schools in existing colleges, wherein students would receive the basic science portion of their training at minimal additional expense, would make it possible to fill these existing spaces in the shortest possible time and thereby make the quickest impact on the shortage of physicians.

Recruitment for the Health Professions

Recommendation 20. The Commission recommends programs designed to attract young people into the health professions and related disciplines.

Specifically, the Commission recommends:

A. That a program of project grant support for health careers education and recruitment activities be established, whereby funds would be made available on a matching basis to community agencies or medical institutions, with preference being given to coordinated community effort, to mount such programs as strengthened health education programs in grade schools and junior high schools, to communicate health information and interest children in health careers; health science fairs in which leading medical institutions would sponsor and assist high school students in developing health interest; community speakers' bureaus and sources of recruitment literature on health careers; summer employment opportunities for young people in laboratories, hospitals, health agencies, etc. Recommended appropriations to the Public Health Service for this purpose would be

$1 million the first year, with incremental steps to a level of $10.6 million in the fifth year of the program.

B. That central sources be established for information, production of educational materials and audiovisuals, to stimulate and implement this national program of recruitment for the health sciences, both within the Public Health Service and in the headquarters of national professional and voluntary organizations.

C. That the Health Professions Educational Assistance Act be amended to provide for a program of Federal scholarships for talented medical and dental students in need of financial assistance to complete their professional education, with a matching cost-of-education grant to the professional school accompanying each scholarship.

During recent years, the number of college graduates has been increasing, but the proportion of college graduates applying for medical school has declined. Among the reasons why medicine as a career has declined in popularity are the high cost of medical training; competition from many other stimulating careers, especially in science; and the comparatively small number of scholarship and training grants available for medical students.

A considerable number of fellowships are available for graduate work in the sciences through the National Science Foundation, National Institutes of Health, the Department of Defense, other Government agencies, and private industry. Fellowships are available in other fields under the provisions of the National Defense Education Act. Yet very few fellowships or scholarships have been made available for medical students, except for those being trained specifically for research work.

There are a number of constructive measures which can be taken to overcome these obstacles. There should be an expansion of scholarships from Federal, State, and private agencies for students in medical schools, especially for those from lower income families who cannot afford the high cost.

The program of Federal scholarships originally proposed for the Health Professions Educational Assistance Act for talented medical and dental students in need of financial assistance would greatly enhance both the quality and quantity of applicants for medical education by broadening the base of recruitment to include students coming from families with low or moderate incomes. The matching cost-of-education grants of $1,000 for each scholarship would also be of assistance in meeting the operating deficits of the medical and dental schools.

Undergraduate Training in Medical and Dental Schools

Recommendation 21. The Commission recommends the continuation and expansion of existing grant programs to support undergraduate training in medical schools in heart disease; undergraduate training in medical and dental schools in cancer; and medical undergraduate training in rehabilitation. In addition it recommends the development of an undergraduate training support program in stroke, administered by the National Institute of Neurological Diseases and Blindness.

Specifically:

A. The current undergraduate training grant appropriations to the National Heart Institute should be continued and increased by about $1.55 million annually to permit eligible schools to receive grants of $40,000 per year.

B. The undergradute training program in cancer administered by the National Cancer Institute should be broadened to include the development of demonstration programs in the detection of cancer and care of the cancer patient and expanded so that it is possible to incorporate cancer training in training programs for interns and residents.

C. In view of the need for undergraduate training in stroke, it is recommended that $2 million be appropriated annually to the National Institute of Neurological Diseases and Blindness for the development of an undergraduate training program in stroke.

D. Additional funds should be made available to the Vocational Rehabilitation Administration to expand its present program for medical undergraduate training in rehabilitation.

It is recommended that $9.5 million be appropriated over a five-year period starting with $1 million the first year to the National Cancer Institute to provide grants to those medical schools which develop specific educational programs in these aspects of cancer control.

The following is a summary table of recommended appropriations:

AREA	Year				
	1	2	3	4	5
Heart Disease*	1.55	1.55	1.55	1.55	1.55
Cancer*	1.0	1.5	2.0	2.5	2.5
Stroke*	2.0	2.0	2.0	2.0	2.0
Rehabilitation*	2.0	2.0	2.0	2.0	2.0
Dental school grants*	0.5	0.5	0.5	0.5	0.5

*Figures in millions of dollars.

E. In view of the important role played by the dentist in the early detection of oral cancer and the need for the education of dental students with regard to cancer control, the Commission recommends an increase of $10.000 in the annual undergraduate training grant presently awarded to dental schools by the National Cancer Institute. This will require an additional annual appropriation of $500,000 to the National Cancer Institute.

F. In the light of the importance of preventive activities associated with control of heart disease, cancer and stroke greater emphasis should be given to preventive medicine in medical school curricula, with special attention to the chronic disease field.

Training for Research

Recommendation 22. The Commission recommends that the national program of research training grants be enlarged and expanded at a rate commensurate with the training capacity of organizations so engaged and the national pool of young investigators desirous of such training.

Specifically, the Commission recommends:

A. That the existing programs of research training grants and fellowships in heart disease, cancer, and the general medical sciences be expanded;

The following table summarizes the recommended appropriations over and above current NIH appropriations to expand the research training programs in heart disease, cancer and stroke:

AREA	Year				
	1	2	3	4	5
NHI—Training grants and fellowships*	4. 3	5. 2	6. 3	7. 5	8. 75
NCI—Training grants and fellowships*	4. 3	5. 2	6. 3	7. 5	8. 75
NINDB—Training grants and fellowships*	1. 0	1. 0	1. 0	1. 0	1. 0
NIGMS—Training grants and fellowships*	6. 0	9. 25	12. 5	15. 5	18. 5
Training in animal care*	0. 5	0. 75	1. 0	1. 2	1. 5

*Figures in millions of dollars.

B. That the National Institute of Neurological Diseases and Blindness should develop a research training grants program in the field of stroke, and in addition, that funds should be made available to the Vocational Rehabilitation Administration for training grants in rehabilitation;

C. That the Division of Research Facilities and Resources of NIH be given the authority and funds to support training programs for specialists in animal care and medicine.

Research is conducted by the minds of trained scientists. It is in the national interest, therefore, to insure a continuing and expanding supply of biomedical scientists adequately trained to guarantee the quality of health research tomorrow.

The funding instrument most suitable to the task of assisting the university, or other research-educational organization, in providing such advanced training is the "training grant." This instrument permits local identification of young men and women with research potential, provides them with appropriate stipends and, equally important, by diverse means assists the institution to improve the quality of research training while enlarging its capacity for so doing.

This program has resulted in a pronounced upgrading of research training during the last 5 years. Its continuation and growth is vital to the entire health research enterprise. Indeed, failure at this time to expand such training support must, automatically, limit the magnitude of the entire national health research program in subsequent years.

Universities have developed a variety of mechanisms for enriching the experience of potential physician-investigators. The most formal of these lead to the simultaneous award of the M.D. and Ph. D. degrees.

In any case, the student so engaged must devote several additional years to this experience, as well as satisfy the requirements for the medical degree, under-

The following appropriations are recommended to mount a program in clinical training in heart disease. stroke and rehabilitation.

AREA	Year				
	1	2	3	4	5
Heart Disease*	5.0	7.0	9.0	12.5	15.0
Stroke*	1.0	1.0	1.0	1.0	1.0
Rehabilitation*	1.0	1.0	1.0	1.0	1.0

*Figures in millions of dollars.

take several years of residency training, and perhaps serve his obligated military experience before actually embarking on a research career. This is demanding not only of his time but of the financial resources of his family. Without additional support, clearly the pool of clinical investigators becomes limited to those whose families possess the financial resources to underwrite this lengthy and expensive program.

The Commission therefore urges that consideration be given to a new national program providing full financial support to those students who aspire to a career of medical research and for whom the institution provides a clearly defined program which combines medical education with research training.

Support of Clinical Training

Recommendation 23. The Commission recommends the establishment of clinical fellowships and full-time clinical investigatorships in heart disease and stroke, the expansion of clinical training programs in cancer, and the establishment of clinical fellowships in rehabilitation.

A. In the heart disease and stroke fields there is urgent need for clinical training for the physicians who are ultimately responsible for carrying the fruits of research to the majority of the American people. And yet, under current policy guidelines, the National Heart Institute and National Institute of Neurological Diseases and Blindness can only support training that is research oriented. Greater emphasis must be placed on the training of superior clinical physicians.

There is a great need for a larger corps of clinicians who are capable of precise diagnosis and providing the best of treatment—clinicians with minds capable of recognizing and applying new discoveries and clinical observations. To meet this need, authority should be granted and the funds appropriated to the Public Health Service for the establishment of clinical fellowships and full-time clinical investigatorships in the cardiovascular field.

B. To recruit medical graduates into cancer specialties in which there is a marked shortage of personnel, the Commission recommends that $500,000 per year be appropriated to the Cancer Control Program in support of residency training in a limited number of specialties essential for progress in cancer control and unlikely to lend themselves to private specialty practice. A supported resident should be required to spend at least one year of his training period in work directly related to cancer and the details of his training program should be specified at the time grant requests are made.

In addition, the existing program of Senior Clinical Traineeships administered by the Cancer Control Program should receive appropriations of $3.5 million to increase the present number of traineeships to the level of 300. It is further recommended that priority should be given to those specialties necessary in cancer control which have the greatest personnel shortage—for example, radiology, radiotherapy, physical medicine and rehabilitation, preventive medicine, pathology, anesthesiology, and epidemiology.

C. A program of clinical fellowships in rehabilitation will substantially increase the number of physicians capable of rendering the best in rehabilitative

care. To this end, the Commission recommends that funds be made available to the Vocational Rehabilitation Administration to initiate such a program.

Stabilization of Academic Positions

Recommendation 24. The Commission recommends the establishment of full-time career awards in universities and other institutions, not only for research personnel but also for clinical investigators and clinical professors.

The research career awards program of the National Institutes of Health has made a vital contribution by establishing stable positions for career investigators in universities. Through this program leading scientists have been able to plan and pursue lifetime research careers without depending upon year-by-year approval of specific projects.

The Commission regrets the fact that a moratorium has been declared on new appointments to this program and urges that support be increased so that the program may be expanded.

There is, in addition, a pressing need for the development of stable academic positions to encourage the lifetime pursuit of teaching careers in medicine. Fellowships and career awards parallel to those awarded for research are necessary to support faculty members in clinical investigation and practice.

Such faculty members could vitalize and broaden the program of every clinical department and more effectively close the gap between advancing scientific knowledge and application.

The recommended program would involve the establishment of full-time positions in universities and medical schools for *clinical investigators* or *clinical professors.* In some instances such professorships might be used to recruit some of our best practitioners from a heavy private practice and enable them to concentrate on teaching. Recommended appropriations to implement this program would be at the level of $8 million and progress to $24 million in 5 years.

Training of Health Technicians

Recommendation 25. The Commission recommends greatly increased effort and investment in the recruitment and training of health technicians and other paramedical personnel whose skills are essential to the control of heart disease, cancer and stroke.

Specifically, the Commission recommends:

A. The establishment of a coordinating office within the Department of Health, Education, and Welfare to provide liaison among the agencies supporting educational programs which could be of great importance in training ancillary health manpower, such as the Manpower Development and Training Act of 1962, the Vocational Education Assistance Act of 1963, and the Economic Opportunity Act of 1964.

B. A program of stimulation grants administered by the Public Health Service, made available to community and junior colleges for the development of teaching methodology, curriculum, and courses for the training of personnel such as associate degree nurses, laboratory technicians, and the full range of technical personnel that can support and extend the work of the frontline professionals; appro-

priations recommended for this program would begin at the level of $0.4 million and progress to $2 million in the fifth year.

C. Increased support of the program for training medical technicians, including technologists and other specialists essential to the detection and treatment of cancer, now existing in the Cancer Control Program, from its present level of $1.5 million per year to $2.5 million in the first year with annual increments thereafter of $1 million.

The supply of health manpower to support a full-scale attack on heart disease, cancer and stroke can be recruited and developed only if full use is made of existing programs and authorities, especially those which can recruit into the ancillary health disciplines persons not normally attracted into health pursuits, including the economically disadvantaged, and technologically displaced, the handicapped, and the elder citizens.

It is ironic that the health disciplines suffer from chronic shortage at a time when the nation as a whole is experiencing serious problems of manpower surplus.

Training of Specialists in Health Communications

Recommendation 26. The Commission recommends that the Office of Information and Publications in the Office of the Surgeon General be allocated a specific annual sum of $1 million solely for training specialists in health communications.

Specifically, the Commission recommends:

A. A grant program to educational institutions for the development of pilot training programs in the field of medical communications. Such grants should support the development of a core curriculum, the payment of faculty, and provision of stipends for trainees. A university which has both a medical center and a school of journalism would serve as an excellent setting for these pilot training programs in communications.

B. Provision of fellowships for the on-the-job training of a variety of personnel in the gathering and writing of science information materials. Many of these men and women would be trained in the various agencies of the Public Health Service; many would be trained in our medical centers and large research institutions throughout the country.

In addition we recommend that the Public Health Service conduct and support seminars and other methods designed to give professional science writers the background they need to write accurately, responsibly, and clearly on health subjects.

Continuous Assessment of Health Manpower Needs

Recommendation 27. The Commission recommends the establishment in the Bureau of State Services (Community Health) of the Public Health Service of a health manpower unit, comparable to the research manpower unit of the National Institutes of Health, responsible for continuous assessment of national manpower requirements for health services.

Such a unit would have the following responsibilities: (1) To develop baseline information on medical manpower and analyze its meaning; (2) to develop national goals relating to medical manpower and resources; (3) to conduct and support studies and demonstrations related to determining manpower needs, defining specific problems, and recommending improved training and recruitment programs to overcome these manpower problems; and (4) to disseminate information on all aspects of health manpower. Appropriations of $0.5 million for the first year, increasing to $1 million by the fifth year, are recommended.

It has been estimated that by 1975 there will be a need for 172,000 additional medical technicians for laboratory work alone. If needs for other types of health technicians were added, the requirement becomes staggering. However, no good estimates of need are available. Studies have been made in recent years of the needs for physicians, dentists, and nurses, but the health technician field has been largely ignored.

Therefore, the Commission further suggests that the Surgeon General appoint a group to study the problem of health technician personnel and develop recommendations for its solution.

TOWARD THE CONQUEST OF HEART DISEASE, CANCER AND STROKE

ADDITIONAL FACILITIES AND RESOURCES

Many additional facilities and resources are required to mount the full-scale attack on heart disease, cancer and stroke envisioned by the Commission.

The two parallel thrusts of the campaign—the application of existing knowledge through patient care and the development of new knowledge through research—both depend upon supporting services which, like the basic manpower and facilities already discussed, are in short supply.

Expanding Patient Care Facilities

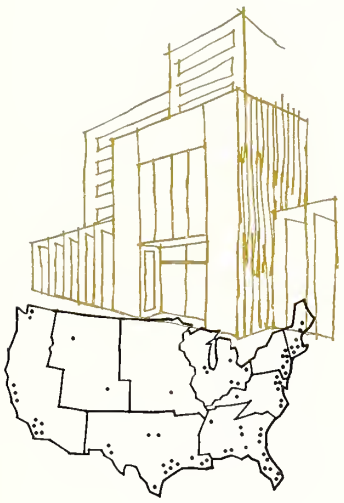
Recommendation 28. The Commission wholeheartedly endorses the 1964 Amendments to the Hospital and Medical Facilities Construction (Hill-Burton) Act and urges their full implementation. It is further recommended that more funds be made available for the expansion of long-term care facilities affiliated with hospitals.

The Hill-Burton program for the construction of hospital and medical facilities, administered by the Public Health Service, has been one of the most remarkable achievements in the history of bringing better health to more people in any part of the world. This program has received widespread recognition and acceptance by the people of the United States and by its Congress.

The 1964 Amendments to the Hill-Burton Act, in addition to extending the life of the program, contain important new provisions which will enable the program to meet these changing challenges more effectively. It provides for—

1. A new grant program for modernization or replacement of public and nonprofit hospitals, and other health facilities, giving special consideration to those located in the more densely populated areas where the greatest need exists.
2. A program of project grants to help develop comprehensive regional, metropolitan area, or other local area plans for health and related facilities.
3. A single category of long-term care facilities, which combines the previously separate grants programs for chronic disease hospitals and nursing homes, and lifts the annual ceiling from $40 million to $70 million.
4. The use by States of 2 percent of their allotments (up to $50,000 a year) to assist in the efficient and proper administration of the State plan.

The Commission, in endorsing this forward-looking legislation, considers that the continued strengthening of the nation's patient care facilities is an indispensable ingredient in the national program against heart disease, cancer and stroke. This need is particularly acute in the area of long-term care facilities to serve the rapidly increasing numbers of patients suffering from the chronic diseases and requiring such care.



Strengthening the Federal Hospital Program

Recommendation 29. The Commission recommends that existing Federal hospital systems administered by the Veterans Administration and the Public Health Service be given authority and funds which will enable them to augment their contribution to research, training and patient care in heart disease, cancer and stroke.

Specifically, the Commission recommends:

A. That the Veterans Administration be given increased appropriations to carry out research in aging and chronic disease, including heart disease, cancer and stroke; the specific authority and funds to make research project grants to affiliated medical schools for collaborative research projects in these fields; and the increased appropriation necessary to further develop its existing program of scientific manpower training.

B. The Division of Hospitals of the Public Health Service be appropriated funds necessary for renovation and the development of research space in existing facilities, and for increased research and training activities.

With its 168 hospitals, 89 affiliated with medical schools, and 91 outpatient clinics and regional offices, the Veterans Administration has the largest system of health care facilities in the world. In the past year 610,000 patients were admitted to VA hospitals; 3,695,000 were followed as outpatients. Of the patients admitted, 107,000 had cardiovascular disease and 40,000 had cancer, newly diagnosed in about 30,000. A professional staff of more than 9,000 physicians, psychologists, social workers, and Ph. D. scientists provide a high level of care as well as participate extensively in research, education, and training activities.

The VA is carrying on a vigorous program of fundamental and clinical research. Its staff participated in 6,500 research projects in Fiscal Year 1964, with 2,000 of them related to heart disease, cancer, and neurological diseases. Much of this research effort is conducted in association with 78 VA-affiliated medical schools.

In the area of education and training, nearly 18,000 undergraduate and graduate students in medicine or allied fields received some part of their training in VA facilities in 1963. Among these were 10 percent of the nation's medical residents.

The Commission commends this major contribution to the nation's research and training effort and urges that the Veterans' Administration be supported in further developing these vitally important programs.

It urges also that the smaller but still significant Public Health Service hospital system, which has taken promising steps toward an increased research and training program in recent years, be supported in the development of its full potential for research and training as well as patient care.

Medical Libraries

Recommendation 30. The Commission recommends that the National Library of Medicine be authorized and adequately supported to serve its logical and necessary function as the primary source for strengthening the nation's medical library system.

Specifically, the Commission recommends:

A. That $2 million per year for a 5-year period be made available to the National Library of Medicine for intramural research and developmental activities to explore new technologies for more efficient management and dissemination of the world's biomedical literature;

B. That not less than $30 million per year for 5 years be authorized and appropriated to the National Library of Medicine for a program of grants and contracts to support improved medical library services in the United States—including facilities, resources, training of personnel, secondary publications, and library and communications research;

C. That broadly conceived legislation be initiated clearly authorizing the National Library of Medicine to assist medical libraries in the ways recommended herein.

Communication of information to scientists and practitioners is critically important to progress in research and application of medical knowledge. Medical libraries are the primary vehicle for accomplishing this communications process.

Yet the nation's medical library system is grossly inadequate for the task, due to a serious imbalance of extramural support. For example, in 1964 the Public Health Service appropriations totaled over $1 billion. But less than $1 million accrued directly or indirectly to the extramural support of medical libraries.

The National Library of Medicine is the cornerstone of the national medical library network. Through its development of the world's largest collection of the published medical literature and through its sponsorship and operation of the MEDLARS system, the largest computer-based information storage and retrieval system yet to be devised, the NLM has demonstrated its ability to improve the methodology and efficiency of this medical library network.

It is urgent that further steps be taken to enable NLM to improve the efficiency of this network.

But to exercise its proper leadership the NLM requires both broadened legislative authorities and additional funds for the purposes of strengthening and enlarging its intramural activities, and for the purpose of conducting the type of extramural support program the Commission has in mind.

The Commission's recommendations are directed simultaneously to the strengthening of NLM and to the bolstering of the other components of the nation's medical library network.

National Medical Audiovisual Center

Recommendation 31. The Commission recommends that the Public Health Service Audiovisual Facility be enlarged in scope and strengthened so that it may become a National Medical Audiovisual Center.

To this end we recommend the following specific steps:

A. The appropriation of $1.5 million for necessary renovation and expansion of the existing physical plant.

B. Appropriation of $1.5 million for the first year, scaled upward to $4 million for the fifth year, to develop an intramural program at the Audiovisual Center which would include production, experimental use and evaluation of

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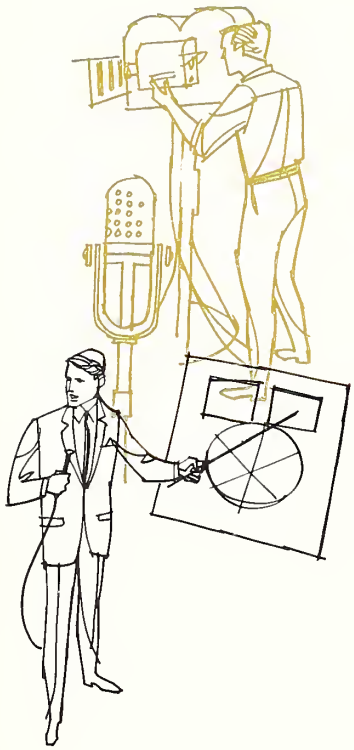

educational materials in such areas as radio, television, motion pictures, programmed instruction, etc.; research and training programs in audiovisual fields; international exchange of medical motion pictures; and other purposes.

C. Authorization of an extramural program of grants and fellowships and appropriations to support such a program beginning at the level of $1.5 million per year and rising to $8 million at the end of a 5-year period. Such a program would enable the Audiovisual Center to support selectively promising projects in audiovisual communications at medical schools, community hospitals, and other institutions and to assist, through training grants and fellowships, in the development of a national cadre of medical communications specialists.

In addition to the program outlined above, the National Medical Audiovisual Center should exert immediate and strong leadership in two communications media of particularly high promise for continuing education of the health professions.

These are, first, the field of closed circuit television which is already being used sporadically, to a limited extent, by medical schools, hospitals and other health agencies; and second, the use of portable projectors for cartridge-type films which are especially adaptable to private use by physicians in their own offices, at times of their own choosing.

We therefore recommend that:

(*a*) an appropriation of $2 million per year, initially, be made to the National Medical Audiovisual Center for the specific purpose of developing, disseminating and evaluating closed circuit television programs on subjects of vital interest to the health professions, and

(*b*) an initial appropriation of $1 million per year be made to the National Medical Audiovisual Center to produce short films for use in cartridge-type projectors, and to promote the widespread use of this promising new educational device by the medical profession.

Statistical Programs

Recommendation 32. The Commission recommends improved systems for the collection, interpretation, and dissemination of statistics essential to the understanding and efficient control of heart disease, cancer and stroke.

Specifically, the Commission recommends:

A. A project grant program to the States administered by the National Center for Health Statistics to finance the salary of competent statisticians and supporting services, designed to improve the quality and timeliness of data collected through death registration; to carry out epidemiological studies using the death record as a point of departure; and to permit intensive analysis of mortality data. The sum of $750,000 should be appropriated to initiate this program, increased to $1.5 million in the second year and reaching a level of $3.5 million by the fifth year.

B. Full support of the Public Health Service request for funds to survey hospital discharge records on a sampling basis.

C. Stimulation by the Public Health Service of studies of medical practice to determine methods of treatment in everyday use.

D. A grant program administered by the National Center for Health Statistics for the training of individuals in health demography, providing both academic graduate training and applied training. The estimated cost of supporting about 70 students in such a program is $500,000 per year.

E. A program to educate physicians and others in the proper methods for certification of cause of death, and a small continuous survey to evaluate the quality of the medical record.

F. Appropriations of $500,000 per year to the Division of Chronic Diseases for the establishment of a National Center of Program Statistics in heart disease, cancer, stroke, and other chronic diseases, to provide to the operating programs essential data on the nature and magnitude of specific disease problems in communities and the present utilization of existing care resources.

G. That cancer be made a reportable disease and that the sum of $1 million per year be made available to the National Cancer Institute to be used in assisting States in initiating cancer reporting systems. Assistance should be provided in organizing the reporting system, providing consultation services, purchasing equipment, and providing temporary clerical or other services, in an amount not to exceed $50,000 for any State during the first year and not to extend beyond 3 years. Priority in establishing cancer reporting systems should be given to States representative of the various regions in the United States.

The Commission, in reviewing existing statistical data on heart disease, cancer and stroke, recognized certain areas of vital and health statistics that are in need of development. In our expanded national effort to reduce the toll of heart disease, cancer and stroke, strong statistical programs are necessary to describe the nature of the problems to be dealt with, to pinpoint targets for effective action, and to provide indications of progress toward the goals.

Animal Resources for Biomedical Research

Recommendation 33. The Commission recommends additional appropriations and authority as needed to enable the Division of Research Facilities and Resources, NIH, to support an improved national program of construction of laboratory animal facilities, to construct special regional facilities, and to support the training of specialists in the care of animals needed for biomedical research.

Specifically, the Commission recommends:

A. That the Division of Research Facilities and Resources be given increased appropriations to implement a national program of construction and improvement of integrated institutional animal facilities and resources:

B. That the DRFR be given specific appropriations to construct and operate two or three regional Laboratory Animal Genetic Centers (other than Primate) and two or three regional centers for Research in Laboratory Animal Medicine (other than Primate);

C. That the capabilities of existing institutions be fully utilized through a program of project grants and contracts;

D. That the DRFR be given the specific legislative authority and appropriations necessary to support training programs for veterinarians, husbandrymen, and other animal disease specialists.

Appropriation levels recommended for these activities are $10 million for the first year increasing to $20 million by the fifth year.

Many striking advances in disease control could not have been achieved without the use of laboratory animals. As research vistas widen, the dependence on animal test systems becomes greater. The need is not only for increased number but also for improved quality, both in respect to freedom from disease and to specificity of genetic makeup.

The sophisticated research of today demands sensitive instruments which can reproducibly record subtle changes. If the research animal, which represents such a sensitive system, by virtue of disease or variable genetic constitution, reacts inconstantly or unpredictably to experimental situations, time, money, and the experiment are lost. Such occurrences are, in fact, not uncommon. Inadequate animal housing facilities, often by promoting a high incidence of infection, have frequently accounted for such experimental failures.

The Commission's recommendations are designed to strengthen our laboratory animal resource in a number of ways to assure that biomedical research in heart disease, cancer and stroke will not be delayed or negated by failures in the supply, nature, and condition of laboratory animals.

A Clearinghouse for Drug Information

Recommendation 34. The Commission endorses current proposals for the establishment of a National Drug Information Clearinghouse, in association with the National Library of Medicine, serving and supporting governmental and nongovernmental drug information units.

The proposed clearinghouse would include full information on the chemical structures and biological properties of all known compounds and the derivatives of such chemicals, with regard for their cellular, environmental, and social effects. It would gather information from all reliable sources, including the published literature, conference proceedings, government reports, and other records. Further, the clearinghouse would produce, both for general and specific users, annotated bibliographies, systematic files of information on drugs in forms suitable for replication, critical reviews, compilations of evaluated data, judgmental responses to individual inquiries, and other appropriate information.

Improper use of drugs is today an important cause of avoidable disease. The gaps and wasteful duplication associated with present independent efforts to handle drug information are responsible for much important information failing to reach those who need it most. Therefore, in view of the progressive increase in the consumption of medications and other chemical products, the proposed clearinghouse will serve an important national need.

International Research and Training Programs

Recommendation 35. The Commission endorses the principle that support of research outside the United States by competent foreign nationals, collabo-

rative research involving American and foreign laboratories, training of American scientists in foreign laboratories and of foreign scientists in American laboratories are in our national interest, and endorses programs designed to achieve such ends.

The Commission suggests the following guidelines:

A. Cooperative research projects and programs representing joint efforts of American and foreign investigators should be budgeted from funds appropriated in support of domestic rather than international research.

B. Health research and training in those nations wherein there are substantial amounts of Public Law 480 funds should be supported to a maximum extent possible up to the limits of their resources of trained manpower and research facilities.

C. Increased opportunities should be made available to foreign graduates to allow them to come to the United States for further training in biomedical and clinical research so that such newly acquired knowledge can be applied on their return to their native countries.

D. In scientifically and economically more privileged countries where research and training activities are good, the following guidelines are recommended:

(a) Federal agencies supporting research and research training should continue such activities in all nations in which such opportunities exist;

(b) The criteria for judging applications for research grants from such countries should be unusually rigorous with respect to the quality of the project proposed and the competence of the investigator-applicant;

(c) The magnitude of our health research support program should reflect local opportunities and the needs of agency programs rather than an arbitrary fixed fiscal ceiling;

(d) Prior to payment of research grants overseas, a representative of the agency concerned, together with our Science Attaché in that nation, should enter into negotiation with appropriate officials of the nation concerned with a view to establishing the terms and limits of the research support in question.

International research offers unparalleled opportunities for advancing our knowledge of heart disease, cancer and stroke for a number of reasons.

The United States has by no means a monopoly on scientific excellence in these fields. Moreover, the contrasting patterns of disease in different cultures may offer important clues to their control. Still further, the interchange of research philosophy and methodology between nations has proved highly productive.

The Commission therefore urges that international programs be maintained at levels consistent with the mutual interests of the nations and scientists involved

TOWARD THE CONQUEST OF HEART DISEASE, CANCER AND STROKE

RECOMMENDED CHANGES IN LEGISLATION AND ORGANIZATION

Federal action in any field depends basically upon two factors: legislative authority as expressed in laws passed by the Congress, and funds appropriated by the Congress each year to carry out these authorized activities. A third factor important to the effectiveness of Federal programs is the organizational structure of the agencies involved.

Many of the recommendations of the Commission, as described in the preceding chapter, can be carried out by the Public Health Service or other agencies operating under their existing authorities. As has been noted in the case of each separate recommendation, many of the programs proposed will require additional appropriations if the attack against heart disease, cancer and stroke is to be advanced at an accelerated pace.

Some of the recommended actions, however, cannot be undertaken without changes in existing legislative authority or the creation of new authority. Therefore, in this Chapter, recommendations concerning the most important legislative needs are indicated.

In addition, it includes a recommendation for reorganization within the Department of Health. Education, and Welfare which would, in the Commission's view, greatly facilitate and strengthen the full-scale campaign against heart disease, cancer and stroke.

I. LEGISLATIVE RECOMMENDATIONS

The first legislative recommendation of the Commission, as set forth below is for a comprehensive amendment and recodification of the Public Health Service Act. The reasons underlying this recommendation stem from the fact that the present Act is seriously obsolete. The type of national attack needed to reduce the toll from heart disease, cancer and stroke cannot be fully mounted until more effective legislative devices are made available.

However, recognizing the time required and the difficulty involved in securing the drafting and enactment of a legislative modification of such magnitude, interim legislative proposals are recommended for those new or changed authorizations so important to the campaign against heart disease, cancer and stroke that they cannot await the omnibus revision.

1. Revision of the Public Health Service Act

The last major overall revision or codification of the Public Health Service Act was done 20 years ago.

In the intervening 20 years, however, there have been tremendous changes in all areas of the health field. The rapid growth of the biomedical research effort

has produced numerous pressing needs for more effective legislative devices. At the same time the growth in importance of the chronic diseases has had a great impact on health programs. The recognized need for comprehensive community health services demands of the Public Health Service a mission and a program of action that far exceed the confines of public health agencies in the past.

The response to this changing challenge has thus far taken the form of piecemeal, spasmodic amendments to the basic Act as particular pressures and needs arose.

It has become abundantly clear. therefore, that if the program proposed by the President's Commission on Heart Disease, Cancer and Stroke is to be effectively implemented. as well as for many other important reasons. there must be a thoroughgoing and comprehensive revision and recodification of the Public Health Service Act. The matter should be given intensive study by experts in the field, and a legal instrument suitable to the health needs of the nation in these times and for the future should be developed and enactèd. Because studies of legislative change tend to be prolonged and laborious, it is important that a deadline be set for completion of this action.

Recommendation

It is recommended that the Department of Health, Education, and Welfare establish a task force to develop a comprehensive revision and recodification of the Public Health Service Act by November 1, 1965.

2. Expansion of Resources for Preparation of Health Manpower

The Commission recommends that legislation be sought to permit forthright support of medical education, this program to include formula grants to the health professions schools. Immediately, there should be full utilization of the Health Professions Educational Assistance Act of 1963 and the Nurse Training Act of 1964. The Commission further recommends substantially greater and more diversified Federal support of programs designed to increase the supply of physicians, dentists, and medical scientists.

3. Construction and Operation of Health Research Facilities

The need to expedite a direct and immediate research attack upon heart disease, cancer and stroke on a nationwide basis has underscored the importance of flexible authority to construct and operate research facilities to meet the national and regional needs in these areas.

The principal deficiency which greatly hampers the efforts of the National Institutes of Health in these fields is that current authorizations are much too low to meet existing requirements.

In addition, the rigid ceiling of 50 percent which the Federal Government may now contribute in matching monies to aid in the construction of health research facilities should be lifted to a new maximum of 75 percent—the same ceiling now in force with regard to Federal participation in the construction of mental retardation research facilities.

The present 50 percent ceiling for other than mental retardation research facilities works a most severe hardship on those institutions in less economically favored parts of the country which cannot compete, in raising matching monies, with the large, established research complexes. Yet these smaller and financially weaker research institutions are the very ones we must strengthen if we are to achieve a truly broad, regional expansion of our research effort.

There is also a lack of nonmatching authority for the construction of research facilities that are national or regional in their scope. Therefore, because of the urgent need to expedite the national research effort on heart disease, cancer and stroke, the following recommendations are made:

Recommendations

A. *There should be an increase in the annual appropriation authorization for health research facility construction from the present $50 million to at least $150 million.*

B. *The participation by the Federal Government should be increased from 50 to 75 percent.*

C. *New substantive authority should be given to construct, on a nonmatching basis, and to provide for the operation of, by contract or otherwise, research facilities for national regional research purposes.*

4. Construction and Operation of Facilities for the Application of the Fruits of Research

One of the major recommendations of the Commission is designed to assure that the best that modern medical science can offer for diagnosis and treatment of heart disease, cancer and stroke is accessible in all areas of the nation. The Commission's view is based upon its conviction that the value of the national investment in research is wasted unless the fruits of research are applied for the benefit of all the people when and where the need exists. For these purposes, a grant program is proposed for the establishment of diagnostic and treatment stations in appropriate academic and community institutions. The operational support for care in such stations would, as in all such institutions, come from a variety of sources. This proposal does not in any way affect the normal methods of payment for care, such as direct payment by patients and third-party payments through private insurance, public welfare payments, and other sources. The proposed participation is in the nature of a stimulation grant to help provide the nucleus for operations and help assure that the best quality of service is available for all of the people.

Recommendation

New substantive authority should be given for initial construction, renovation, equipment, and development of regionally oriented diagnostic and treatment stations and to provide necessary incentive through partial operating grant support for a nucleus of highly qualified staff in these stations.

5. Authorization for Necessary Transfer of Program Funds within an Institute, and for Limited Transfer of Funds between Institutes

A. It is of paramount importance that the Directors of the various Institutes, with the approval of the Director of the National Insitutes of Health and after fully informing the respective Appropriations Committees of the House and Senate of the reasons for such action, be given the authority to transfer funds from one program to another within their overall annual Institute appropriation.

It is impossible for Institute Directors, who testify before Congress in the spring of one fiscal year, to predict with absolute precision the exact financial requirements of programs to be implemented a year or more in the future. Furthermore, the Institutes frequently receive their initial apportionments 6 months and more after a fiscal year has begun; such delays in allocations obviously force a reassessment of program directions.

Over the past few years, the NIH has been subjected to unfair criticism because it has returned sizeable amounts of unspent reserves to the Treasury. If the Institute Directors had flexible authority to reallocate funds after proper consultation, they could redirect funds from programs which cannot be initiated because of factors beyond their control to programs in which a sizeable backlog of *scientifically approved* applications has built up.

B. It is also important that a proviso reinstating the right of the Director of the National Institutes of Health to transfer a limited portion of one Institute budget to another be included in future appropriations acts. Such transfer authority should only be exercised when a scientific judgment has been reached that a particular year's appropriation to an Institute cannot be fully and prudently used as determined by each Institute Director and each Institute Advisory Council.

Recommendation

A. *It is recommended that the Institute Directors, after appropriate consultation, be given the authority to transfer funds within their overall annual Institute appropriation.*

B. *The previous authority of the Director of the National Institutes of Health to transfer limited funds from one Institute to another should be reinstated.*

6. More Effective and Flexible Use of Grants and Contracts for Research and Development

The Commission is convinced that the national campaign against heart disease, cancer and stroke could be accomplished more effectively and expeditiously if more flexible utilization were possible in the use of contracting authority and if there were continuing availability of appropriated funds.

In regard to contracts, the Public Health Service currently carries out its arrangements under authority delegated from the General Services Administration which has restrictive limitations concerning advanced payment, the inclusion of construction costs and multiple-year agreements. Adequate research contract authority would enable the research program leaders of the Public Health Service to use their best judgment in matching the research support mechanism to program needs in the accomplishment of the research mission.

With regard to the single-year availability of funds, the Commission has noted that the Public Health Service is the only Federal organization with a major research and development program that does not have multiple-year fund availability which permits the continuing use of funds for this purpose after the end of a fiscal year.

For the foregoing reasons, the following recommendations are made:

Recommendations

A. *The Public Health Service should be given basic authority in research contracts to:*
   1. *Commit support for extended periods of time, e.g., up to 5 years and advance payments;*
   2. *Provide for construction when such is essential to the accomplishment of the contract purposes;*
   3. *Contract for clinical and domiciliary care where necessary to achieve research purposes;*
   4. *Provide for the design and conduct of broad and comprehensive research and development programs in which the contractor has wide latitude for action in achieving a given objective.*

B. *The Public Health Service should be given multiple-year fund availability for research and development activities.*

7. *Project Grant Authority for Heart Disease Control, Cancer Control, and Chronic Disease Programs, and for the National Center for Health Statistics*

The Public Health Service authority to make project grants in its programs dealing with health application activities in communities is inconsistent. Thus, the Venereal Disease Control and Tuberculosis Control Programs as well as the Neurology and Sensory Disease Control Program have project grant authority. In addition, the Community Health Services and Facilities Act Program also has a limited type of project grant authority.

The Commission is particularly concerned with the lack of such authority in the Heart Disease Control, Cancer Control, and Chronic Disease programs. Also, the National Center for Health Statistics does not have such authority despite the fact that the improvement of vital and health statistics at their source is essential to progress in these health program areas. While the inclusion of a general authority for all control programs to make project grants is strongly recommended for the comprehensive revision of the Public Health Service Act, it is believed urgent that interim authority for project grants be extended to the programs mentioned in order that the recommendations of the President's Commission on Heart Disease, Cancer and Stroke can be implemented more fully without delay.

Recommendation

It is recommended that the Heart Disease Control, Cancer Control, and Chronic Disease Programs, and the National Center for Health Statistics be authorized to make project grants.

8. Authorization for a Program for the Support and Stimulation of a National Medical Libraries Network

It is clear that a major factor inhibiting the reduction of the burden of heart disease, cancer and stroke involves the inadequacy of communications in the field of the medical sciences. Moreover, it is clear, as with the problems of health manpower supply, that the correction and improvement needed can only be achieved by attacking the fundamental reasons underlying the deficiencies.

One of these fundamental factors involves the inadequacies of the medical libraries throughout the nation—another effect of the scientific revolution in which the advancement of knowledge has outstripped the ability to manage it. Consequently, in order to facilitate scientific communication, substantive legislation is necessary, providing a flexible program of planning, stimulation and support of an improved National Medical Libraries Network to assure all areas and all medical schools, scientists, and practitioners of the benefit of effective access to all medical data and information.

Recommendation

A legislative proposal should be developed and enacted providing for the support and stimulation of a National Medical Libraries Network. Particular attention should be given to authorizations relating to recommendations of the President's Commission on Heart Disease, Cancer and Stroke concerning the establishment of a network of medical libraries including a limited number of regional libraries; library facility construction; training for medical librarians; and a program of research designed to improve systems and methods of handling medical literature.

9. Establishment of Revolving Fund for the National Medical Audiovisual Center

One of the important recommendations of the Commission calls for the expansion of the Public Health Service Audiovisual Facility at the Communicable Disease Center into a National Medical Audiovisual Center. Particular reference in this regard is made to the operational trial of the use of a projector for the in-office continuing education of practicing physicians in which the audiovisual center would be charged with responsibility for the production of a series of films on heart disease, cancer and stroke subjects. In order to carry out such a program it is desirable that the audiovisual center have the maximum flexibility to permit it to carry out its projects in a most efficient manner. The establishment of a revolving fund fiscal arrangement, with the accompanying authority to sell or rent its productions, would greatly facilitate the ability of the center to carry out these programs.

Recommendation

It is recommended that authorization for the establishment of a revolving fund with any necessary authorities to permit the sale or rental of medical audiovisual productions as appropriate be given to permit the National Medical Audiovisual Center of the CDC to carry out its function with maximum efficiency.

10. Comprehensive Amendment to the Vocational Rehabilitation Act

Much of what has been said with regard to the need for basic revision of the Public Health Service Act applies to the Vocational Rehabilitation Act. There is a considerable degree of obsolescence in this legislation, and many of the important proposals of the President's Commission on Heart Disease, Cancer and Stroke cannot be implemented with full effectiveness under existing authority.

Recommendation

It is recommended that the Department of Health, Education, and Welfare establish a task force to develop a comprehensive revision of the Vocational Rehabilitation Act by November 1, 1965.

11. Amendment of the Community Health Services and Facilities Act

A number of recommendations particularly in the manpower and communications areas could be accomplished through the Community Health Services and Facilities grant program if it were broadened by the simple deletion of the restricting phrase "outside the hospital particularly for the chronically ill or aged persons," and if its appropriations ceiling were removed. These recommendations include such proposals as a national health careers program; a greatly expanded program of research and demonstration in Community Health Services for the more effective utilization of health manpower; stimulation grants for the development of the capacity of community colleges for training middle-level health technician manpower; support and stimulation of continuation education programs; incentive grants to stimulate community planning and coordination of health services; and developmental grants to stimulate and assist the university medical center to extend its resources and competencies to the communities in its area.

Recommendation

That the Community Health Services and Facilities Act be amended to eliminate the phrase restricting projects to those pertaining to "outside the hospital particularly for chronically ill or aged persons" and suspension of the appropriations ceiling pending overall amendment of the Public Health Service Act.

II. REORGANIZATION RECOMMENDATION

The specific programs needed to combat heart disease, cancer, and stroke and the legislation necessary to initiate and carry out this expanded national effort, as recommended by the Commission, relate primarily to the Department of Health, Education, and Welfare. The Commission considered whether the existing administrative and personnel resources within the Department were adequate for the development of the proposed programs.

This study was necessarily limited as to both scope and depth. But it did become apparent to the Commission that, in the health area at least, the Department of Health, Education, and Welfare lacked adequate executive depth and functional organization to provide the leadership, support, coordination, and review required by its large and complex programs. Such deficiencies could be obstacles to effective development of the recommended programs for the control of heart disease, cancer and stroke.

Furthermore, it became apparent to us that the Public Health Service and particularly the National Institutes of Health would be absolutely unable to initiate the sweeping recommendations we endorse in the body of this report unless its personnel force is increased appreciably, and unless present Federal salary ceilings are raised significantly to both retain existing personnel and to attract new personnel. We are aware of the fact that the National Institutes of Health is still losing some of its top scientists and administrators because its salary scales do not compete with salary scales for comparable positions in medical schools, universities and industry.

The major problem seems to be an insufficient number of high-level policy positions to provide effective leadership and coordination of the Department's many programs which are basic to the internal strength of the nation. The Department has only five such positions: Secretary, Under Secretary, two Assistant Secretaries, and an Advisory Special Assistant to the Secretary (Health and Medical Affairs). It also has a career Administrative Assistant Secretary and a General Counsel.

These people are expected to provide effective leadership of a Department with over 80,000 employees, with about 130 programs (over 40 in health), and with annual expenditures of $6 billion from budget appropriations and about $15 billion from trust funds.

Even from a casual study of the situation, and certainly in comparison with other Departments of Government, it seems obvious that strengthening of the Department of Health, Education, and Welfare at the top is greatly needed.

Recommendation

The Commission recommends that a reorganization of the Department of Health, Education, and Welfare be effected to provide specific high-level policy, direction and coordination of health programs, with adequate supporting policy positions.

Summary of Appropriations Recommendations Including Those for New Programs and Increases for Existing Programs and Comparison With Estimates of Current Levels of Support

Chapter		Estimated Current Level of Support (1965) [1]	Year				
No.	Title		1	2	3	4	5
3	A National Network for Patient Care, Research and Teaching in Heart Disease, Cancer and Stroke		[2] 153.25	237.875	364.475	421.4	453.45
4	Application of Medical Knowledge in the Community	18.5	49.65	61.65	63.15	45.15	53.15
5	Development of New Knowledge	152.8	56.55	83.7	107.9	40.2	49.5
6	Education and Training of Health Manpower	37.7	45.05	63.95	78.15	93.75	110.65
7	Additional Facilities & Resources	11.2	52.25	56.00	61.00	66.00	72.50
	TOTAL		356.75	503.175	674.675	666.50	739.25

[1] Includes only programs for which specific appropriations recommendations are made in this report.
[2] Figures in millions of dollars.

Recommendation		Year				
No.	Title	1	2	3	4	5
1	Regional Centers for Heart Disease, Cancer and Stroke	[1]87.5	126.5	198.1	208.9	230.7
2	Diagnostic and Treatment Stations	36.75	66.875	106.125	138.25	133.75
3	Development of Medical Complexes	25.0	37.5	50.0	62.5	75.0
4	Development of Additional Centers of Excellence	3.0	6.0	9.0	10.0	12.0
5	A National Stroke Program Unit	1.0	1.0	1.25	1.75	2.0
	Subtotal	153.25	237.875	364.475	421.4	453.45

[1] Figures in millions of dollars.

Recommendation		Year				
No.	Title	1	2	3	4	5
6	Community Planning Grants	[1] 1.0	1.0	1.0	1.0	1.0
7	Community Health Research and Demonstration	5.0	6.0	7.0	8.0	10.0
8	Support of Community Programs	18.5	24.5	18.0	24.0	30.0
9	Statewide Programs for Heart Disease Control	2.5	2.5	3.5	.....	.....
10	National Cervical Cancer Detection Program	5.0	7.5	10.0	.....	.....
11	Continuing Education of Health Professions	10.1	12.1	14.1	8.1	8.1
12	Public Information on Heart Disease, Cancer and Stroke	7.55	8.05	9.55	4.05	4.05
	Subtotal	49.65	61.65	63.15	45.15	53.15

[1] Figures in millions of dollars.

Recommendation		Year				
No.	Title	1	2	3	4	5
13	Biomedical Research Institutes	[1] 7.5	15.0	22.5	30.0	37.5
14	Specialized Research Centers	4.05	6.7	9.4	10.2	12.0
15	Research Project Grants	35.0	47.0	56.0	.....	.....
16	Contracting Authority for Research and Development	10.0	15.0	20.0	.....	.....
	Subtotal	56.55	83.7	107.9	40.2	49.5

[1] Figures in millions of dollars.

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Recommendation		Year				
No.	Title	1	2	3	4	5
20	Recruitment for the Health Professions	[1] 1.0	2.5	5.0	7.5	10.6
21	Undergraduate Training in Medical and Dental Schools	7.05	7.55	8.05	8.55	8.55
22	Training for Research	16.1	21.4	27.1	32.7	38.5
23	Support of Clinical Training	10.0	12.0	14.0	17.5	20.0
24	Stabilization of Academic Positions	8.0	16.0	18.0	20.0	24.0
25	Training of Health Technicians	1.4	2.8	4.2	5.6	7.0
26	Training of Specialists in Health Communications	1.0	1.0	1.0	1.0	1.0
27	Continuous Assessment of Health Manpower Needs	0.5	0.7	0.8	0.9	1.0
	Subtotal	45.05	63.95	78.15	93.75	110.65

[1] Figures in millions of dollars.

Recommendation		Year				
No.	Title	1	2	3	4	5
30	Medical Libraries	[1] 32.0	32.0	32.0	32.0	32.0
31	National Medical Audiovisual Center	7.5	8.0	10.0	12.0	15.0
32	Statistical Programs	2.75	3.5	4.0	4.5	5.5
33	Animal Resources for Biomedical Research	10.0	12.5	15.0	17.5	20.0
	Subtotal	52.25	56.00	61.00	66.00	72.50

[1] Figures in millions of dollars.

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THE HISTORY AND OPERATION OF THE COMMISSION

The Formation of the Commission

In his Health Message to Congress early in 1964, President Lyndon B. Johnson stated:

"Cancer, heart disease and strokes stubbornly remain the leading causes of death in the United States. They now afflict 15 million Americans—two-thirds of all Americans now living will ultimately suffer or die from one of them.

"These diseases are not confined to older people.

- "Approximately half of the cases of cancer are found among persons under 65.
- "Cancer causes more deaths among children under age 15 than any other disease.
- "More than half the persons suffering from heart disease are in their most productive years.
- "Fully a third of all persons with recent strokes or with paralysis due to strokes are under 65.

"The Public Health Service is now spending well over a quarter of a billion dollars annually finding ways to combat these diseases. Other organizations, both public and private, also are investing considerable amounts in these efforts.

"The flow of new discoveries, new drugs, and new techniques is impressive and hopeful.

"Much remains to be learned. But the American people are not receiving the full benefits of what medical research has already accomplished. In part, this is because of shortages of professional health workers and medical facilities. It is also partly due to the public's lack of awareness of recent developments and techniques of prevention and treatment.

"*I am establishing a Commission on Heart Disease, Cancer and Strokes to recommend steps to reduce the incidence of these diseases through new knowledge and more complete utilization of the medical knowledge we already have.*

"The Commission will be made up of persons prominent in medicine and public affairs. I expect it to complete its study by the end of this year and submit recommendations for action."

On March 7, the President announced the names of the members of this Commission and on April 17, 1964, the Commission held its first meeting in the White House. The President addressed the Commission as follows:

"Ladies and Gentlemen: On beautiful days like this, the President and school boys have a hard time staying indoors. I think we would set a good example for the Nation, and we would advance the cause that brings us together, if we we would take time for a brisk walk outside this morning. I am a subscriber

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to the view once expressed that if you want to know if your brain is flabby, you better feel your legs.

"Health is something that we treasure in this house where you are gathered this morning, and I know it is treasured in every house throughout our land and around the world. It was said several centuries ago, health is the greatest of all possessions. A pale cobbler is better than a sick king.

"The work that you have begun today is work in which I have the keenest and greatest and the most personal interest. You are here to begin mapping an attack by this Nation upon the three great killers, the three great cripplers—heart, cancer, and stroke disease. These three account for the majority of deaths and much of the serious disability which strikes our people every year.

"I have asked you to undertake these three objectives: First, to measure the full magnitude of the impact of these diseases upon the Nation; second, to evaluate our resources for acquiring new knowledge that we already have; third, to identify the obstacles which stand in the way of advancing knowledge and give us guidelines on overcoming those obstacles.

"To this group I do not think I need to tell you how vital this is. Unless we do better, two-thirds of all Americans now living will suffer or die from cancer, heart disease, or stroke. I expect you to do something about it. Five million Americans a year are struck down in the prime of life by heart attacks, often fatal. Every two minutes cancer strikes a man or a woman or a child in this country. Every year strokes leave 200,000 Americans dead and another 2 million incapacitated.

"I want us to put our great resources—and they are unlimited—to work to overcome this. We can, and because of the work you will do, I believe we will. So let me say this: I know there are some differing viewpoints about the prospects for success in these fields, but from what some of you on this Commission have reported to me, and from some other sources that I believe in, I think our goals are in sight. It is well within the range of reasonable expectation that work being done now in regard to controlling growth of cells in the human body will bring decisive victories over heart disease and cancer and strokes.

"The point is, we must conquer heart disease, we must conquer cancer, we must conquer strokes. This Nation and the whole world cries out for this victory. I am firmly convinced that the accumulated brains and determination of this Commission and of the scientific community of the world will, before the end of this decade, come forward with some answers and cures that we need so very much. When this occurs—not 'if,' but 'when,' and I emphasize 'when'—we will face a new challenge and that will be what to do within our economy to adjust ourselves to a life span and a work span for the average man or woman of 100 years.

"Knowing Government as I do, I am sure some President some day will be appointing a commission to study that very great problem, and I would be pleased to be that President. If you do your work well and if you do your work with dispatch, maybe I will have that privilege.

"I have often been reminded myself of Shakespeare's line, 'A good heart is worth gold.' I am glad mine is good now and if the doctors and the Secret Service and my guardians in the press will just permit me to get my exercise, I intend to keep it that way.

"I want to thank you very much for beginning the work that I think will ultimately win the hardest fight that we have ever fought, and I would suspect that just as we look back on Lincoln's proclamation a hundred years ago, when he took the chains off the slaves, I would suspect that some day your grandchildren and great, great grandchildren will be looking at this picture made this morning in this beautiful rose garden, all the thorns are inside, and see the leadership of 50 States who are willing to give their talents and their energies and their imaginations, and stay awake at night and roll over and go get a glass of water and come back and think some more on how to get the results that we know are within our reach.

"In my judgment, there is nothing that you will ever do that will keep your name glorified longer, and that will make your descendants prouder than this unselfish task that you have today undertaken to get rid of the causes of heart disease and cancer and stroke in this land and around the world. What can be more satisfying than to feel that you have preserved not a life, but millions of them, for decades. I am here to say to you that while we are interested in the food stamp plan, we are interested in medicare for the aged under social security, we are interested in the civil rights bill that we consider most essential to our leadership in this country and in the world, we are interested in the pay bill that will keep our good civil servants here, we are interested in the immigration bill that will permit families to join each other, and we are interested in the poverty bill that will take our boys out of the pool halls and out of the slums and out of the juvenile delinquency centers of the Nation—we are interested in all those things.

"There is nothing that really offers more and greater hope to all humanity and to preserving humanity than the challenge in the task that you have undertaken. You have among you some of the great doctors, some of the great public servants of our time. Somehow, some way, some time, you are going to find the answers, and I hope it will be soon.

"Thank you."

Organization of the Commission

The Commission organized itself into the following Subcommittees with the following Chairmen:

Heart Disease	—Dr. Irving Wright
Cancer	—Dr. Sidney Farber
Stroke	—Dr. John Meyer
Research	—Dr. Philip Handler
Manpower	—Dr. Edward Dempsey
Communications	—Mr. Emerson Foote
Facilities	—Mr. Arthur Hanisch
Rehabilitation	—Dr. Howard A. Rusk

The Chairmen constituted the Executive Committee of the Commission.

Methods of Operation

The Commission established the following methods of operation:

1. The collection of information from agencies, groups, and institutions concerned with these diseases through letters, staff visits, surveys, etc.
2. The holding of hearings at which expert witnesses from the widest possible range of interests, both public and private, presented their views and discussed the issues involved.
3. The preparation of the report and its recommendations and their submission to the President.

A letter was sent to the professional organizations and voluntary health agencies listed in Appendix D, informing them of the appointment of the Commission and indicating that the Commission "would welcome a written statement setting forth the overall views of the organization on the problems pertinent to the mission of the Commission and any suggestions and recommendations." The response to this request was most gratifying and the Commission expresses its appreciation to these organizations for their assistance.

In approaching its task, the Facilities Subcommittee considered it desirable to determine the overall need for patient care, research, and educational facilities. As no estimate of National needs was available, the Subcommittee undertook a National survey of medical, dental, osteopathic, public health, and veterinary schools; of research centers; and of community hospitals to obtain information regarding their needs, plans, and problems concerning the construction of new space and the renovation of old. The results of this survey are reported in detail in Volume 2.

During November, the Second National Conference on Cardiovascular Diseases was held. Several hundred cardiologists and scientists spent over a year preparing a survey of the entire field of cardiovascular diseases for review and discussion at this Conference. All of this material was made available to the Commission, and the Commission would like to express its appreciation to Dr. E. Cowles Andrus, Conference Chairman, and to the Conference participants for their generous assistance.

In view of the need for obtaining information and views on the economic aspects of heart disease, cancer and stroke, the Commission obtained a detailed analysis of the economic costs of these diseases. In addition, Dr. Walter Heller, Chairman of the Council of Economic Advisors to the President, called together a group of economists for a meeting on September 30, 1964, to discuss this area. A report of this meeting is presented in Volume 2. The Commission expresses its gratitude to Drs. Heller, Arrow, de Janosi, Hansen, Klarman and Scitovsky for their help.

Each of the Subcommittees held hearings to which were invited individual experts, representatives of selected voluntary health agencies and professional organizations and official Federal, State, and local health agencies. The opinions and recommendations of these individuals were obtained, and an official transcript was made of each of these meetings.

A total of 45 such meetings were held, and more than 166 experts appeared at these hearings, and the Commission is deeply grateful to those who came to these meetings, most of which were held in Washington. More than 7,500 pages of testimony, amounting to many millions of words were obtained. A list of these witnesses appears as Appendix E.

Each of the Subcommittees reviewed the testimony, in addition to background material, and prepared a report including recommendations. Each of these reports was then reviewed by the Executive Committee, which held 10 meetings during the term of the Commission. The Commission itself met as a whole 6 times, several of which were two days in length, to review the reports and recommendations of each of the Subcommittees and of the Executive Committee. These reports were brought together in a unified fashion to serve as the report of the Commission.

Agencies and Professional Organizations Contacted

American Academy of General Practice
American Academy of Neurology
American Academy of Oral Pathology
American Academy of Pediatrics
American Academy of Physical Medicine and Rehabilitation
American Association of Cancer Research
American Association of Dental Schools
American Association of Obstetricians and Gynecologists
American Cancer Society
American College of Cardiology
American College of Chest Physicians
American College of Obstetricians and Gynecologists
American College of Physicians
American College of Preventive Medicine
American College of Radiology
American College of Surgeons
American Dental Association
American Diabetes Association
American Heart Association
American Hospital Association
American Medical Association
American Medical Women's Association
American Neurological Association
American Nurses' Association
American Nursing Home Association
American Osteopathic Association
American Public Health Association
American Society of Clinical Pathologists
American Society of Medical Technologists
American Society of Neurosurgeons
American Thoracic Society
Arthritis and Rheumatism Foundation
Association of American Medical Colleges
Association of Life Insurance Medical Directors
Association of Rehabilitation Centers
Association of Schools of Public Health
Association of State and Territorial Health Officers
Association of State Chronic Disease Program Directors
Catholic Hospital Association
College of American Pathologists
Group Health Association of America
Group Life Insurance, Inc.
Health Insurance Council

Health Insurance Institute
Institute of Life Insurance
Inter-Society Cytology Council
International Union Against Cancer
Leukemia Society
Life Insurance Medical Research Fund
National Association of Social Workers
National Dental Association
National Health Council
National League for Nursing
National Medical Association
National Rehabilitation Association
National Society for Crippled Children and Adults
Public Health Cancer Association
Society of Actuaries
Society of Public Health Educators
U.S. Conference of City Health Officers

List of Witnesses Who Appeared Before the Subcommittee

Dr. Frank Adair, Breast Cancer Specialist, and Past President, American Cancer Society, New York, New York

Mr. Scott Adams, Deputy Director, National Library of Medicine, Bethesda, Maryland

Dr. Robert A. Aldrich, Director, National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, Maryland

Dr. Otis Anderson, Medical Liaison, American Medical Association, Washington, D.C.

Dr. E. Cowles Andrus, Professor Emeritus, Johns Hopkins University School of Medicine, Baltimore, Maryland

Mr. Daniel Bailey, Assistant to the Director, National Library of Medicine, Bethesda, Maryland

Dr. A. B. Baker, Professor and Chairman, Department of Neurology, University of Minnesota Medical Scool, Minneapolis, Minnesota

Dr. Gordon Barrow, Director, Cardiovascular Disease Control Service, Georgia Department of Public Health, Atlanta, Georgia

Mr. Carl Berkley, Consultant, RCA Laboratories, Princeton, New Jersey

Dr. Robert Bowman, Chief, Laboratory of Technical Development, National Heart Institute, National Institutes of Health, Bethesda, Maryland

Dr. David Brand, Chief, Heart Disease Control Branch, Division of Chronic Diseases, Bureau of State Services, Public Health Service, Washington, D.C.

Dr. Lester Breslow, Chief, Division of Preventive Medical Services, California Department of Public Health, Berkeley, California

Dr. Ray Brown, Director of Program of Hospital Administration, Duke University Medical Center, Durham, North Carolina

Dr. Kevin Bunnell, Associate Director, Western Interstate Commission for Higher Education, Boulder, Colorado

Dr. Mary I. Bunting, President, Radcliffe College, Cambridge, Massachusetts, and a Commissioner, U.S. Atomic Energy Commission, Germantown, Maryland

Dr. T. H. Butterworth, Representative, Society of Public Health Educators, Inc., Washington, D.C.

Dr. John L. Caughey, Jr., Associate Dean, Western Reserve University School of Medicine, Cleveland, Ohio

Dr. Philip Cohen, Chairman, Department of Biochemistry, University of Wisconsin, Madison, Wisconsin

Dr. Clifford Cole, Chief, Neurological and Sensory Disease Service Program, Division of Chronic Diseases, Bureau of State Services, Public Health Service, Washington, D.C.

Dr. Donald A. Covalt, Associate Director, Institute of Physical Medicine and Rehabilitation, New York University Medical Center, New York, New York

Dr. Russel W. Cumley, Executive Director, Medical Arts Publishing Foundation, Houston, Texas

Dr. Emerson Day, Director, Strang Clinic, New York, New York

Dr. George Deaver, Institute of Physical Medicine and Rehabilitation, New York University Medical Center, New York, New York

Dr. Bowen C. Dees, Assistant Director (Planning), National Science Foundation, Washington, D.C.

Dr. D. Denny-Brown, James Jackson Putnam Professor of Neurology, Harvard Medical School, Harvard University, Boston, Massachusetts

Dr. Harold S. Diehl, Senior Vice President for Medical Research and Medical Affairs, American Cancer Society, New York, New York

Dr. Leonard Diller, Chief, Psychological Section, Institute of Physical Medicine and Rehabilitation, New York University Medical Center, New York, New York

Dr. James P. Dixon, President, Antioch College, Yellow Springs, Ohio

Dr. Patrick Doyle, Deputy Commissioner, Vocational Rehabilitation Administration, Department of Health, Education, and Welfare, Washington, D.C.

Dr. Renato Dulbecco, Salk Institute for Biological Studies, San Diego, California

Dr. Charles Dunham, Director, Division of Biology and Medicine, Atomic Energy Commission, Germantown, Maryland

Dr. Charles E. Dunlap, Chairman, Department of Pathology, Tulane University School of Medicine, New Orleans, Louisiana

Mr. H. P. Dunning, Program Management Officer, Cancer Control Branch, Division of Chronic Diseases, Bureau of State Services, Public Health Service, Washington, D.C.

Dr. Harry Eagle, Albert Einstein College of Medicine, Yeshiva University, New York, New York

Dr. Paul Ellwood, Executive Director, Sister Elizabeth Kenny Foundation, Minneapolis, Minnesota

Dr. Kenneth Endicott, Director, National Cancer Institute, National Institutes of Health, Bethesda, Maryland

Dr. Lester Evans, Consultant in Education for the Health Professions, University of Illinois Medical Center, Chicago, Illinois

Dr. Shirley C. Fisk, Deputy Assistant Secretary of Defense, Health and Medical, Washington, D.C.

Dr. Reginald Fitz, Dean, University of New Mexico School of Medicine, Albuquerque, New Mexico

Dr. C. Miller Fisher, Assistant Clinical Professor of Neurology, Department of Neurology, Massachusetts General Hospital, Boston, Massachusetts

Mr. Leslie Flory, RCA Laboratories, Princeton, New Jersey

Mr. Pierre Fraley, Executive Secretary, Council for the Advancement of Science Writing, Phoenixville, Pennsylvania

Dr. Aaron Ganz, Chief, Research Career Section, Research Fellowships Branch, National Institute of General Medical Sciences, National Institutes of Health, Bethesda, Maryland

Dr. Leo J. Gehrig, Chief, Bureau of Medical Services, Public Health Service, Washington, D.C.

Dr. Louis Gerber, Chief, Nursing Homes and Related Facilities Branch, Division of Chronic Diseases, Bureau of State Services, Public Health Service, Washington, D.C.

Dr. David Gelfand, Chairman, Rehabilitation Committee, American Medical Association, Philadelphia, Pennsylvania

Dr. Eli Ginzberg, Professor of Economics, Graduate School of Business, Columbia University, New York, New York

Mr. John S. Gleason, Jr., Administrator of Veterans' Affairs, Veterans Administration, Washington, D.C.

Mr. Kermit Gordon, Director, Bureau of the Budget, Washington, D.C. Accompanied by Mr. Sutton and Mr. Loweth

Dr. Saxon Graham, Associate Cancer Research Scientist, Roswell Park Memorial Institute, Buffalo, New York

Dr. Harald M. Graning, Chief, Division of Hospital and Medical Facilities, Bureau of State Services, Public Health Service, Washington, D.C.

Dr. Eugene Guthrie, Chief, Division of Chronic Diseases, Bureau of State Services, Public Health Service, Washington, D.C.

Mr. John Hagan, Rehabilitation Consultant assigned to Coordinating Committee on Nation-wide Stroke Programs, American Heart Association, New York, New York

Dr. Robert Haggerty, Professor and Chairman, Department of Pediatrics, University of Rochester School of Medicine, Rochester, New York

Dr. Jack C. Haldeman, President, Hospital Planning Council of Southern New York, New York, New York

Dr. Seymour Harris, Littauer Professor of Political Economy, Graduate School of Public Administration, Harvard University, Boston, Massachusetts

Miss Inez Haynes, Director, National League for Nursing, New York, New York

Dr. Albert Heyman, Professor of Neurology, Duke University School of Medicine, Durham, North Carolina

Dr. Herman K. Hellerstein, University Hospital, Cleveland, Ohio

Dr. Milton Hoberman, American Board of Physical Medicine and Rehabilitation, New York, New York

Dr. Godfrey Hochbaum, Chief, Behavioral Science Section, Division of Community Health Services, Bureau of State Services, Public Health Service, Washington, D.C.

Dr. Vane Hoge, Assistant Director, American Hospital Association, Washington Service Bureau, Washington, D.C.

Dr. A. Hollaender, Oak Ridge National Laboratory, Oak Ridge, Tennessee

Dr. Donald Hornig, Office of Science and Technology, Executive Office of the President, Washington, D.C.

Dr. Warren V. Huber, Chief, Neurology Division, Veterans Administration, Washington, D.C.

Dr. Charles Huggins, Ben May Laboratory for Cancer Research, University of Chicago, Chicago, Illinois

Mr. J. Stewart Hunter, Assistant to the Surgeon General for Information, Public Health Service, Washington, D.C.

Dr. George James, Commissioner of Health, New York City Department of Health, New York, New York

Dr. Robert S. Jason, Dean, Howard University College of Medicine, Washington, D.C.

Mr. Boisfeuillet Jones, President, Emily and Ernest Woodruff Foundation, Atlanta, Georgia

Mr. Tom Jones, Ethicon, Inc., Somerville, New Jersey

Dr. Charles Kane, Professor of Neurology, Boston University School of Medicine, Boston, Massachusetts

Dr. Norvin Keefer, Chief Medical Director, The Equitable Life Assurance Society, New York, New York

Dr. Jay Hillary Kelley, Office of Science and Technology, Executive Office of the President, Washington, D.C.

Dr. F. Ellis Kelsey, Special Assistant to the Surgeon General for Scientific Communication, Public Health Service, Washington, D.C.

Dr. Charles V. Kidd, Associate Director for International Activities, National Institutes of Health, Bethesda, Maryland

Mr. Earl Klein, Chief, Division of Publication, Office of Labor Statistics, Department of Labor, Washington, D.C.

Dr. Ralph Knutti, Director, National Heart Institute, National Institutes of Health, Bethesda, Maryland

Dr. Paul Kotin, Associate Director for Field Studies, National Cancer Institute, National Institutes of Health, Bethesda, Maryland

Dr. Fredric J. Kottke, Department of Physical Medicine and Rehabilitation, University of Minnesota, Minneapolis, Minnesota

Dr. Edward J. Kowalewski, Chairman, Commission on Environmental Medicine, American Academy of General Practice, Kansas City, Missouri

Dr. Leonard Lecht, Director, National Goals Project, National Planning Association, Washington, D.C.

Dr. Lyndon E. Lee, Jr., Chief, Extra-VA Research Division, Department of Medicine and Surgery, Veterans Administration, Washington, D.C.

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